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ABSTRACT

This paper looks at the selection of students in Australia for trades-based prevocational or pre-apprenticeship courses. Selections for two types of courses are considered in the paper: (1) pre-apprenticeship courses that focus on a particular trade area and usually lead to credit in only one apprenticeship course; and (2) prevocational courses that introduce the student to a number of trade areas and lead to credit in several apprenticeships. The paper is organized in five chapters. Chapter 1 discusses issues in selection, including rationale, selection for particular courses, and other issues. In Chapter 2, research on selection methods for entry into pre-employment and part-time trades courses is reported both for Australia and for other countries. Chapter 3 provides a description of current Australian selection processes for pre-employment courses in each of the states or territories. Chapter 4 contains a discussion of equity of access to education and the selection process, while the final chapter makes recommendations on selection, equity of access, selection tests, and research and evaluation. Extensive references are provided. (KC)

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SELECTION TO PRE-EMPLOYMENT TRADES BASED COURSES

Pauline Mageean

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Pauline Mageean
Project Officer

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PREFACE

This paper looks at the selection of students for trades-based pre-vocational or pre-apprenticeship courses, where such courses carry credit towards an apprenticeship. This credit is normally in the form of a reduction in the amount of time the apprentice must spend on the technical education segment of the apprenticeship, and/or a reduction in the indenture period.

Selections for two types of courses are considered in this paper:

- Pre-apprenticeship courses which focus on a particular trade area and usually lead to credit in only one apprenticeship course;

- Pre-vocational courses which introduce the student to a number of trade areas and lead to credit in several apprenticeships.

Different States have different formats and names for these courses. Where the courses are discussed in general, the name 'pre-employment courses' is used. When courses in a particular State are discussed, the terminology of that State is used.

Hawke and Sweet (1983), in an earlier TAFE National Centre Paper, Some Issues in Access and Selection, discuss many of the philosophical issues and assumptions underlying selection. It is assumed that the reader is familiar with that paper, and points made there will not be re-stated, except when necessary to develop a particular argument. The reader is specifically referred to pages 1-10 of Hawke and Sweet, which discuss selection.

At various times this paper makes reference to correlational studies which compare performance in a selection test to performance on the course or on the job.

Care must be taken in interpreting these correlational data. In Australia, part-time trade students have been selected by their employers and full-time (pre-apprenticeship or pre-vocational) trade students will normally have been selected by the TAFE college.

As the pre-employment students have passed a form of selection before they enter the courses they are, to some extent, a homogeneous group with respect to their selection test results. Therefore correlations between selection methods and performance on the course or on the job will be considerably lower than if the students formed a more heterogeneous group.

CHAPTER 1

ISSUES IN SELECTION

1.1 RATIONALE FOR SELECTION

Selection to pre-apprenticeship and pre-vocational (trade-based) courses which lead into, and receive credit in, trade courses is a relatively new area for most TAFE Authorities and criteria against which selection is to be made need to be determined. Two such criteria are success on the job and success in the course.

Until recently, selection to trade courses has been done by employers when they selected their apprentices. Selection into pre-apprenticeship and pre-vocational courses aims at identifying people capable of completing a demanding apprenticeship and becoming competent tradespersons; that is, selection must be sensitive to the needs of industry.

At the same time, TAFE colleges, as educational institutions, are concerned with the needs of the individual and endeavour to place him or her in an appropriate course. Toward this end, some TAFE colleges offer assistance in vocational guidance. The special needs of disadvantaged groups must also be considered.

Frequently there are many more applicants than places on pre-employment courses, so a form of selection must be made. Some means of choosing those applicants who have the best chance of success, both on the course and on the job, is needed to prevent applicants wasting their time and enduring the frustration of undergoing training which does not suit their abilities. Failing the course could be damaging to a young person's self esteem, especially if it follows a history of failure at school.

Unfortunately, some candidates will fail to be accepted for courses, causing some distress. Counselling concerning suitable vocational areas may help mitigate this. Handled sensitively, failure to be accepted into the course is less likely to prove traumatic than struggling unsuccessfully for months in an inappropriate course. Where there is competition for places, screening is further justified as it gives the places to those who are likely to benefit from the course. This is the most economical use of limited resources and public money.

There are no tests or interview methodologies which can predict with absolute certainty how an individual will perform in the future, but appropriate tests can indicate the probability of success. They can also indicate which applicants would benefit from remedial work or should be counselled to enrol in a different course more suited to their personal strengths and weaknesses.

> . . . even when well-constructed tests are used, the actual material or subjects tested may be quite unrepresentative of the abilities and aptitudes required to succeed in a particular trade. More often than not, selection has been based on performance in only one or two cognitive skills (such as mathematics and reading or spelling) and the result has been the selection of the academic 'cream' in a trade where practical aptitudes and attitudes may be just as important or even more important. Some of those chosen may be totally inappropriate or become frustrated (they may even have been fairly indifferent about wanting to take up the trade in the first place), while very keen students with all the right aptitudes and attitudes and sufficient cognitive skills may be denied their primary career choice. Clearly, before a bank of tests is chosen for selection purposes, a thorough analysis is necessary to identify all the desirable abilities and traits for the given trade. (Kays, 1983, pp. 6-7)

Kays was discussing the selection of apprentices, but his statement is equally applicable to the selection of pre-employment students—caution must be taken to use selection methods which are appropriate for the particular course which is being filled.

1.2 SELECTION FOR PARTICULAR COURSES

Specific tests or other selection methods can be devised for pre-apprenticeship courses, based on the skills and requirements of both the course and the job, as successful performance in these courses gains a student credit in a specific apprenticeship. However, pre-vocational courses lead to credit in more than one apprenticeship. In Queensland, the most frequently run pre-vocational course leads to credit in 19 different apprenticeships. Available resources would not permit the testing of all applicants for all the specific trades areas in which they might possibly claim future credit towards an apprenticeship.

This does not necessarily mean that tests specific to particular trades cannot be used. Most applicants are interested in particular trade areas and so could nominate the areas in which they wished to be tested. Flexibility could be provided if later in the course students wished to concentrate on different areas, for example the decision to concentrate studies in another area could be made in a counselling session with a teacher (who was familiar with the student's performance in the course).

1.3 SELECTION LEVELS

Selection to a pre-employment course can be made on two different levels: the 'threshold level' and the 'entry level'.

Threshold level

This consists of some method of screening which eliminates those applicants who would have a strong probability of failing the pre-employment course or who, even after considerable help, would not be likely to become competent tradespersons. For example, where a course uses a lot of written instructional material, applicants could be screened out if their functional literacy level was so far below the level of this material as to make them unable to use it; if a trade requires quick and accurate manual dexterity, a poorly co-ordinated applicant could be screened out.

Selection at threshold level could require prospective candidates to demonstrate an appropriate level of performance in knowledge and skills directly relevant to course content and/or to on-the-job performance. It could involve attainment tests in knowledge and skills which are prerequisites for performance in the course or job; such as reading skills and basic mathematical skills, without which the student is likely to fail the course and/or fail to perform adequately on the job.

A minimum performance level would thus normally be specified for each test included in the selection battery.

In specific courses in some TAFE colleges where there is sufficient remedial help available to enable the applicant to have a reasonable chance of overcoming the problem, the threshold level could be reduced accordingly. For example, at Hobart Technical College selection is based upon a mathematics test set by the college. Remedial assistance is provided, so the threshold level has been set at the minimal level at which a student, given remedial help, could be expected to cope with on-the-job and course demands. Remedial assistance is also provided in reading, and it is considered that this will be sufficient for a student to cope with demands in this area, so reading has not been measured for threshold selection for this course.

The number of applicants remaining after the screening process should be independent of the number of places available; this process is simply a means of determining which applicants reach the required threshold to:

- cope with the course;
- after training, become competent tradespersons.

The threshold level is particularly significant where screening means a course will not be filled; however, it is a disservice to applicants to place them in courses for which they are not suited and in which they are unlikely to succeed.

There is a problem for test constructors in that tests cannot predict with certainty for any given individual; and the cut-off line (threshold) is to some extent arbitrary, creating a 'grey area'. This is sometimes allowed for by slightly lowering the threshold level, or the selectors may use their discretion and consider other factors if a candidate is very close to the threshold.

Threshold level has two components:

- one related to coping with the demands of the pre-employment course (with remedial help if this is available); for example, reading and mathematics of sufficient level to cope with the instructional material;

- the other is related to performance on the job, both as an apprentice and later as a tradesperson; that is, a prediction of how well a candidate will perform, usually in a workshop environment or on site, after having completed the pre-employment course and without the continual support of TAFE staff. Additional factors are involved such as initiative, work ethic, self-motivation, and the ability to cope with sometimes unpleasant working conditions.

Entry level

This is the actual selection among candidates, all of whom are potentially capable of succeeding in the course and on the job. The number selected is directly determined by the number of places available on the course, and is the level candidates must reach to actually enter the course.

The entry level will vary from one intake to another, depending upon the number of applicants, the number of available places, and the standard of the applicants. Where there are more applicants who are above threshold level than there are available places, the entry level may be raised. Similarly, it is possible that at some periods the candidates will tend to do better on selection measures than at other periods, so that the young person who was rejected at one intake might have been offered a place in a different intake.

As with the threshold level, selection can be in terms of ability to succeed in the course and/or in terms of potential as a competent tradesperson. Entry level and threshold level will sometimes use the same measures, but differ in degree. Other measures will be used exclusively for either threshold or entry level.

Thus it is possible to consider selection methods in terms of where they would be placed on a grid, as shown in Figure 1. The grid illustrates the way in which selection methods may be used to distinguish between applicants according to one or more of four independent standards:

column 1) THRESHOLD LEVEL--course
column 2) THRESHOLD LEVEL--job
column 3) ENTRY LEVEL--course
column 4) ENTRY LEVEL--job

The list of categories of selection methods is not exhaustive.

Different TAFE Authorities may use a particular selection instrument in different ways, a mathematics test could be administered to all applicants and only those who reached a certain standard (the threshold level) would be considered further. If no further use was made of the results, the mathematics test would belong only in the threshold level of the grid. If the mathematics test was based on mathematical requirements needed to cope with the demands of the course, it would belong in the first column, THRESHOLD LEVEL: course; if it was based on the type of mathematics required on the job, it would belong in the second column, THRESHOLD LEVEL: job. Frequently it is based on both, and so would belong in both columns.

If differences in their results on the mathematics test were also used to distinguish between candidates who were above the threshold level, the mathematics test would also be an entry level test. For example, those candidates who did not pass the threshold level on any of several measures might be rejected. The mathematics test results of those remaining could then become one of the factors considered when a decision was being made to determine those who had reached entry level.

If the mathematics test was not given as a threshold test, but only to those who had already reached threshold level, it would not belong in columns one or two. If it was designed to test mathematics needed on the course it would belong in column three; if it was a measure of mathematics needed to perform on the job, it would belong in column four.

In practice, the distinction between tests designed to measure performance on the job, or on the course, is not always made.

This grid is presented as a means of conceptualising the distinctions between the different types of performance being predicted by the various selection methods, and tests are discussed in reference to it.

SELECTION METHOD	STANDARD			
	THRESHOLD LEVEL		ENTRY LEVEL	
	Course	Job	Course	Job
a) Achievement tests e.g. reading attainment				
b) Aptitude tests e.g. object visualisation				
c) Tests for specific trades areas e.g. trainability tests.				
d) Past academic achievement e.g. school results.				
e) Interview				
f) Biographical information e.g. work experience reports, references, applicants' self assessment.				
g) Samples of current skills e.g. models.				

Figure 1.1 Conceptual framework for interpreting results of selection methods

1.4 OTHER ISSUES RELATED TO ACCESS AND SELECTION

Selection ratio

Selection ratio is also important. In Western Australia the ratio of students selected, to number of applicants, went from 1 in 8 in 1978 to 1 in 2.25 in 1984. Under these conditions it may be difficult to find sufficient applicants who can meet the threshold level for some courses.

Access and equity

This is an area of controversy and one in which there are no universally acceptable answers. This paper supports Hawke and Sweet's principle that:

> . . . systems have an obligation to ensure that students are equally provided with educational opportunities of a nature and quality suited to their individual needs, and an obligation to ensure that students enrol in courses in which they have a reasonable chance of success.
>
> This principle
>
> . . . entails a greater degree of attention being paid to student selection, and a greater tailoring of courses to individual needs, than is implied in an open or unrestricted access policy;
>
> . . . carries an implied commitment to efficient use of resources as a necessary corollary of their equitable distribution. (Hawke and Sweet, 1983, pp. 3-4)

When places are finite and greatly outnumbered by applicants, positive discrimination at the selection stage for any particular group means negative discrimination for another group. Thus if candidate A needs only to pass the threshold test and perform adequately in the inteview to be accepted (because A belongs to an under-represented group) while candidate B must also compete with others on selection tests, then B is suffering negative discrimination. This is particularly the case if candidate B seemed a better applicant than A on the basis of the interview, yet was not accepted, because he or she did not succeed as well as others on the selection tests. If employers know that members of certain groups may have been accepted without the rigorous selection used for other candidates, the employers may be less willing to later employ any course graduates who belong to such groups. Thus members of these groups might in practice become further disadvantaged by positive discrimination at the selection stage.

Other means of increasing the numbers of under-represented groups can be found, for example, by developing bridging courses designed to assist such students to compete more equitably for a position on the course. Long-term solutions are necessary to increase participation of such groups, such as workshop experience for primary school pupils. This would enable girls to experience non-traditional female occupations, as part of a mixed class, before their ideas of sex-roles

were as entrenched as those of grade 10 students. The earlier girls and boys participated in such courses as part of the normal school curriculum, the more chance that the girls would accept it as relevant to themselves.

Short-term solutions are necessary for older students. Bridging courses designed to assist such students to compete more equitably for a place on the course is one solution. These could include some courses specially designed for girls, some for students from non-English speaking homes,* others for any young persons who felt they had had limited access to technical knowledge, such as both males and females from single-parent families. Special courses could be designed for disabled persons to assess their capacities to perform on the course and the job, and to assist them to compensate as far as possible for any limitations caused by their disabilities.

Care should be taken that no barriers to the pre-vocational courses remain for those doing the bridging courses, except the selection tests taken in common with all other applicants. Thus the bridging courses should be timed to finish just before the pre-vocational courses start.

Advertising

Advertising is one method of extending or restricting access to courses, as only those who are made aware of the course can apply. To promote equity, and to make the courses potentially available to as wide a group of young people as possible, varied means of advertising should be used.

Before the course is publicised, the client group for whom it is designed should be defined, so that advertising can be aimed correctly. If the course is for school leavers, advertising should be focused on schools. If the client group includes the unemployed then agencies such as CES offices and CYSS groups should be given information. To reach the hidden unemployed (i.e. those who have not registered with the CES) advertising must be in the public media. This will also alert young people who are employed but wish to move into another vocational area.

To gain the attention of the target age group, advertisements should be designed with young people in mind, and where the media are used, advertisements placed where young people are likely to notice them such as during radio programs popular with young people.

Parents frequently alert young people to TAFE advertisements. Therefore, information should be available in major ethnic languages, otherwise young people whose parents are non-English speakers have less chance of becoming aware of, and urged to join, the course.

* This issue is discussed in the Report of the Ethnic Liaison Officer Working Party No. 2, 1983, and in Mageean and Linke, 1984.

Ethnic parents often have a more decisive role than other Australian parents when a young person's future is being decided, particularly in the case of girls. If there is no information available in their language, non-English speaking parents may not know what TAFE has to offer, and be less likely to encourage their sons and daughters to enrol in a TAFE course. Thus even English speaking young people with non-English speaking parents may be indirectly excluded from TAFE courses.

Similarly, unless advertising specifically and immediately makes it clear that courses are open to both genders, many girls will simply assume that the courses are only for boys and will not really consider them. Parents of girls too may tend to dismiss or actively resist their daughters' interest in trades which are non-traditional areas for women; this is particularly the case among some ethnic groups. It is therefore important to translate information for ethnic parents.

Leaflets advertising pre-employment courses must make it immediately clear that they are available to both males and females. One State used a picture of an exclusively male group on the cover and many girls may have discarded it as irrelevant to themselves without discovering that it stated inside the leaflet that both sexes could apply.

Allowances

Unless a living allowance is paid, some young people will be unable to enrol in pre-employment courses. This is a way of restricting access which discriminates against those young people who are from lower socioeconomic groups, living away from home or otherwise unable to receive financial support from their families. These are the very groups that the Commonwealth Government is encouraging to remain in education under the new PEP scheme as stated in the Participation and Equity Program Funding Guidelines to the Commonwealth Education Commissions for 1984.

There is no special scheme to pay a living-away-from-home-allowance to isolated rural youth, where there are no local TAFE pre-employment courses available. Many such people may be ineligible for any existing allowance or other assistance scheme. Those who are unable, for financial or other reasons, to live away from home to attend the courses, are disadvantaged.

This problem may be increased by the Commonwealth's $750 CRAFT Pre-Vocational Graduate Employment Rebate to private employers who engage pre-vocational graduates. This measure may do much to improve the credibility of pre-vocational courses amongst young people. However, it may add considerably to the disadvantage of isolated rural youth who may find the limited apprenticeships available in both local and rural areas going to those young people who have had the advantage of attending pre-vocational courses.

1.5 SUMMARY

It has been suggested that selection for pre-employment courses be based on the needs of both industry and the individual.

Where demand for a course exceeds the number of places available, some means of choosing amongst candidates must be found. Even when there are not more candidates than places, it is important to ensure that those enrolling have the minimum pre-requisites for success in the course. Counselling should be available for those who are unsuccessful in their application.

No selection method can predict future success on either the course or the job with absolute certainty for a given individual. However, it may be possible to indicate the probability of success.

Selection can be divided into two levels—threshold (which identifies those applicants with reasonable likelihood of success on the course and/or on the job) and entry level (the actual selection amongst a number of candidates, all of whom are potentially capable of succeeding in the course and on the job but among whom it is necessary to select because there are less places than qualified applicants).

Care must be taken to ensure that the methods used in selection are appropriate for the particular course; i.e. that the selection tests used are measuring factors relevant to success in the course. Some factors may only be relevant to the threshold level. The amount by which candidates exceed that threshold may be totally unrelated to future success in the area.

Only those who are aware of the course are able to apply to join it. Therefore advertising is a means of extending or reducing access—by directing advertising at particular target groups, and not at others, the likelihood of members of those groups applying will be affected.

If no living allowance is available, young people without other means of support may be screened out. In that case an applicant's ability to obtain financial support becomes a threshold requirement for selection. This is particularly a problem for isolated rural youth.

Ways must be found to encourage and assist under-represented groups to gain access to pre-employment courses without in any way disadvantaging other groups.

CHAPTER 2

RESEARCH ON SELECTION METHODS FOR ENTRY INTO PRE-EMPLOYMENT AND PART-TIME TRADES COURSES

When considering research findings, it is important to recognise that if the students in the courses have been selected on the basis of their test results, the degree of correlation between these results and later performance will normally be lower than if the students formed a more heterogeneous group.

2.1 OVERSEAS RESEARCH

Aptitude Tests

These measure an individual's potential to perform in a specified activity. The West Virginia Board of Education (1979) review of selection methods for students applying for places in post-secondary vocational education centres in the United States found a wide variety of selection methods were used. The most frequently used standardised tests were the General Aptitude Test Battery and the Differential Aptitude Battery. However, aptitude tests have been found less effective in predicting success both in training and on the job than two other methods--trainability tests and biographical data (Ghiselli, 1966b, Asher and Sciarrino, 1974; and Gordon and Kleiman, 1976).

Ghiselli (1973) reviewed the literature on prediction of 'trainability'—i.e. discovering which individuals will master the skills most quickly and/or perform best in training and on the job. Aptitude tests were found to have an average validity correlation of only approximately .39 with trainability and .22 with job proficiency criteria. These low correlations led researchers to look for methods other than aptitude tests to predict future performance.

Simulators

These are aptitude tests in which an applicant manipulates apparatus in a way which simulates the complex interaction of skills required in on-the-job performance.

Simulators were used extensively during the Second World War to select US Airforce personnel. The applicant sat at controls and manipulated levers and presses. Fleishman (1956) found these tests added considerably to the validity of batteries of tests to select trainee pilots when used in combination with the usual paper and pencil tests. However, the fact that the apparatus was complex and expensive, and only one candidate could use each apparatus at a time, led to their being discontinued by the US Airforce in 1955.

Work Sample Tests

Work sample tests are a particular group of vocational achievement tests in which the task set for the subject is similar to the work he or she is to perform on the job. The scoring of work samples may be based on either the process or the product, or both. Scoring may be facilitated and standardised by the use of checklists indicating the points to observe and the relative importance of each (Anastasi, 1968, pp. 424-426).

The concept of work sample tests has had a long tradition in both the USA and the UK although it has not been extensively developed in Australia. As early as 1954, Fleishman reviewed the area of psychomotor skills research and aptitude test development. He particularly considered selection tests which had been given to large numbers of wartime US Air Force personnel applying for training as pilots and found the validity of complex job sample tests was greater than could have been achieved by any combination of factorially simpler tests available at the time.

Work sample tests can be conducted either in test situations, training sessions or during the first period on the job. One method is to use meaningful samples of behaviour such as the amount of time required to complete a prescribed task, which is sometimes referred to as 'time to completion'. Gordon and Cohen (1973), studied 58 welding students on a

> . . . project to train unemployed and under-employed individuals . . . for job entry level work in six vocational fields. (p. 263).

They found that:

> . . . early performance in the lab generally is an excellent predictor of final performance . . . It is possible, therefore, to identify those trainees who will take longer than average to complete the plate welding course by simply examining their performance on the first few tasks. (p. 268).

A correlation of 0.69 was found between first and final tasks, and higher correlations between successive tasks and the final tasks. One reason for this high correlation is the heterogeneous nature of the sample; the trainees had not been pre-selected and therefore would be expected to have a wider range of abilities than those groups who had already passed a pre-selection test. This research was looking at performance during training, not on the job. However, it could serve as a model for other tests validated against on-the-job performance.

Asher and Sciarrino (1974) reviewed 91 studies of work sample tests as predictors of future behaviour in specific jobs, i.e. performance on the job or success in training, in a large number of occupations including motor mechanics, electrical trades and electronic trades. Work sample tests were designed as miniature replicas of the criterion task. Asher and Sciarrino divided work sample tests into two categories—verbal and motor. The motor task involved physical manipulation of things, e.g., tracing a complex electric circuit, and is the category relevant to this paper. Most of the validities reported were significant beyond the .01 level. In most studies a

supervisor's rating was the job proficiency criterion, and completion of training or grades the criterion of success in training. They found that compared with other common selection criteria, motor work samples had, after biographical information, the highest validity coefficients when job proficiency was the criterion. Validity coefficients with successful training were lower but most were significant beyond the 0.01 level. They explained this with a 'point to point' theory which attempts to account for the validity of predictors by the number of elements common to both the predictor and what is actually being measured. There are generally few elements common to both an aptitude test and the actual training or job situation. This is one explanation to suggest why the correlation between aptitude tests and training success or job situation is low. It would follow from their theory that sample tests of training or job behaviour should have a higher correlation with trainability or on-the-job success than aptitude tests.

Schmidt et al. (1977) compared 87 metal trades apprentices' attitudes to a content-valid work sample test, and a well-constructed, content-valid, written job knowledge test. All had been selected into the apprenticeship program on the basis of aptitude test scores among other variables. Twenty-nine (33%) were minority ethnic group members. They found examinees believed the job sample tests were significantly fairer, clearer and more appropriate in difficulty level. They also found the performance test showed significantly smaller ethnic majority-minority score differences than the paper and pencil test ($P < .05$). Schmidt et al. theorised that job knowledge tests, although

> . . . valid in that they correlate with measures of job success . . . may be tapping precisely those determinants of job success on which racial differences are largest, conversely they may fail to tap important determinants of job success on which such differences are smaller or perhaps nonexistent. (Schmidt et al., 1977, p. 188)

[Australian selectors for pre-employment courses have frequently remarked that tests of job knowledge tend to discriminate against females. Schmidt et al.'s statement about ethnic differences may be applicable to sex differences].

Trainability testing

Trainability testing is distinguished from other work-sample testing by Robertson and Downs (1979) - trainability tests include a structured and controlled period of learning and are used to select among people who may have had no experience in the area. Such people will undergo a period of training before being tested.

Trainability tests attempt to reduce the contribution of past experience in the particular skills tested, although inevitably some candidates will benefit from prior learning.

Robertson and Downs reviewed trainability tests developed in the UK between 1968 and 1979 and found they generally took the following form:

- using standardised forms of instruction and demonstration the instructor teaches the applicant the task;

- the applicant is asked to perform the test unaided;

- the instructor records the applicant's performance by noting errors on a standardised error checklist, and estimating the applicant's likely performance in training.

A study by Smith and Downs (1975) involving 89 ship-building apprentices found trainability tests were successful in predicting training performance after 3 months, but were less successful in predicting performance after 12 months. Downs listed four criteria for choosing learning tasks.

The task must

- be based on crucial elements of the job;

- use only such skill and knowledge as can be imparted during the learning period;

- be sufficiently complex to allow a range of observable errors to be made;

- be capable of being carried out in a reasonable amount of time. (Downs S. Trainability Assessments: Sewing Machinist, 1977, as quoted in Robertson and Downs, 1979, p. 46)

Trainability tests would normally be administed by TAFE teachers with experience in the area. They would therefore probably have already developed their own styles of instruction, so it is essential that a standardised form of instruction be adhererd to, while permitting candidates to ask questions. Robertson and Downs (1979) list the minimum requirements for task demonstration as follows:

- details of tools, equipment or materials to be available at the beginning of the demonstration (this includes details of machine settings and types of machinery);

- an unambiguous sequence of operations for the assessor to follow during demonstration, and;

- a list of points to emphasise and of places at which the trainee should participate during the demonstration.

The high face-validity of trainability tests may make applicants view them more favourably and thus produce a performance which is a more valid reflection of the candidate's potential. Gordon and Kleiman (1976) suggested that as work-sample tests are obviously work related, applicants' performance will be moderated by interest and motivation.

They hyphothesised that:

> . . . the face validity of work sample tests may engender differential responses among testees which are related to their interest in, and motivation for, learning a particular

> job . . . work sample tests would possess greater validity than the intelligence test because of the overlap of these motivational elements. (p. 253)

The authors found that a work sample test was a significantly more valid predictor of trainability than an intelligence test in a sample of police recruits.

Table 2.1

SUMMARY OF CORRELATIONS OF THE TRAINABILITY TEST AND THE OTIS-LENNON MENTAL ABILITY TEST, WITH THE TRAINABILITY CRITERION FOR THREE INTAKES OF POLICE RECRUITS.

Correlation	Intake I n=29	Intake II n=27	Intake III n=45
Trainability Test	0.52*	0.72*	0.64*
Intelligence Test	0.33	0.15	0.56*

* $P < .01$

One advantage of trainability testing is that prior experience in the area has much less influence on test results than it does with work samples. As all the skills required are taught during the lesson section, candidates who for some reason may have had less experience are less disadvantaged (e.g. young women may not have had as much opportunity to work with tools or in a workshop as young men and would therefore be at a disadvantage without the lesson). Equity is an important consideration when selection tests are being constructed or chosen.

> . . . by relying upon training behaviour as the trainability predictor, no slurs can be made about restricted training opportunities for members of minority groups . . . due to unfair discrimination by the device employed to select trainees (Gordon and Cohen, 1973, p. 271).

This type of test has not been widely explored in selecting students for TAFE courses which lead to credit in apprenticeships. The author could find only one test currently used for pre-employment selection in Australia which meets Down's criteria, i.e., the test used at Holmesglen TAFE college in the selection of Carpentry and Joinery pre-apprenticeship students.

Biographical Data

This is personal data provided by the applicant about himself or herself, family and, perhaps, aspirations and expectations. Like work sample tests, biographical data has been found to have high predictive validity for trades training (Ghisilli, 1966a, Asher and Sciarrino, 1974; and Gordon and Kleiman, 1976).

Biographical data can be obtained either directly from the applicant, or from the employer or school. The West Virginia Board of Education review in 1979 found that teachers' references were widely used in the USA for selecting students for post-secondary vocational education. Of the seventy major US vocational centres studied, 80% used school counsellors' reports, and 49% used teachers' recommendations as selection criteria.

The Admissions Model, constructed by Associated Educational Consultants, Inc. for Missouri Vocational Technical Programs, 1982, has two rating scales, one for teachers and one for counsellors. (See Appendix). These have the essential quality of being short (each has only 3 items). Each item is defined and it is made clear what each number on the scale represents. However, the definitions show that the items are made up of a number of factors and the scale could be further refined.

If a similar scale was provided for Australian schools and responses sent confidentially to TAFE, this biodata would be available for student selection. As the raters are not obliged to write any comments, these would not make great demands on a teacher's time. It is expected that confidentiality would increase the raters' objectivity and the forms could be returned directly to TAFE in pre-paid envelopes. However, teacher's union regulations currently prevent such ratings being made in NSW.

Asher (1972) reviewed biographical items used as predictors of job efficiency. Compared with other predictors such as intelligence, aptitude, interest and personality, biographical items have vastly superior validity, particularly those which are verifiable (e.g. with school or former employers). This supports similar findings by Ghiselli (1966a) who interviewed 507 men using a selection interview which did not probe deeply into the individual's background and which restricted questions to the applicant's adult career. When corrected for restriction of range, the validity of the interview ratings was 0.51, when the criterion was success in the job over a three-year period. Asher and Sciarrino (1974) found that for motor mechanics, electrical, and electronic trades, biographical items were more valid predictors of performance in both training and on the job than any other commonly used methods, including work sample tests. Asher found that information with the highest validity seems to have a point-to-point correspondence with the criterion.

Owens et al. 1966, quoted in Asher (1972), list four guidelines when constructing biographical questionnaires:

- brevity;
- options should be expressed as numbered categories;
- options should contain all alternatives, or if this is not possible, then an 'escape' option should be provided;
- items should convey a neutral or pleasant connotation.

There seems to be value in discovering what biographical items are related to predicting success in both training and on the job. Such items could then become questions on the application form and be part of the screening process. This would be a simple and inexpensive way of increasing validity.

Comparative Studies

Pucel et al. (1972) administered a battery of tests to students accepted into post-high school vocational/technical schools in the following trades areas:

- automotive;
- electrical;
- welding.

The test battery consisted of:

- the General Aptitude Test Battery (Form B) (GATB));
- the Sixteen Personality Factor Questionnaire (16PF);
- the Minnesota Importance Questionnaire (MIQ);
- the Vocational Development Inventory (VDI);
- the Minnesota Vocational Interest Inventory (MVII);
- the Minnesota Scholastic Aptitude Test (MSAT).

The criteria of vocational student success with which these tests were correlated were:

- graduation versus dropping out of the program;
- being employed in a job related to training versus being unemployed or employed in an unrelated job one year after graduation;
- job satisfaction (as measured by the three scales of the Minnesota Satisfaction Questionnaire (MSQ) and the five scales of the Minnesota Satisfactoriness Scales (MSS). All of the correlation coefficients produced were quite low.

For automotive students the MVII score correlated at the $P<0.05$ level of probability with (a) and (b), and GATB correlated $P<0.05$ with MSQI scores.

For electrical students the MVII score correlated at the $P<0.05$ level with (b).

For welding students the GATB score correlated with (b) at the $P<0.05$ probability level.

The relationship between a test and the criteria changed between populations, implying that an instrument that was the most effective predictor of future performance in one population was not necessarily the best predictor of the same criterion in another population. The overall conclusion by Pucel et al. was that the use of standardised tests to predict success in trades occupations is questionable. However, the most effective predictors were interests, job needs, and personality. Sex was the only variable consistently related to the prediction of each of the criteria within the population.

> This strongly indicates that the weighting of instrument scales which is most influential in predicting the success of males is different from that most influential in predicting the success of females. (Pucel et al., 1972, p. 37).

None of the multiple correlation coefficients between the total set of instrument scales and the criteria were above .40 for any of the three populations, male, female and combined. This indicates that the test instruments and the personal data were not very effective in predicting vocational student success.

2.2 AUSTRALIAN RESEARCH

Test batteries studied

Hawke (1976a) looked at the predictability of the test battery used to select students for electrical trades courses at Sydney Technical College in 1972 and 1973. This consisted of:

- the ACER Otis Higher Test Form B (OHB), a test of verbal reasoning;
- the ACER Silent Reading Test, Form C—Part 1;
- Word Knowledge Form C (WKC), a vocabulary test;
- the Entrance Mathematics Test (EM), a test of attainment in mathematics at a year 9 to year 10 level of difficulty. The Entrance Mathematics Test is comprised of two parts—Part A: arithmetic, and Part B: algebra;
- the total mathematics score which is the sum of the scores on parts A and B.

These tests are typical of the paper-and-pencil tests used in selection for pre-apprenticeship courses.

All of these tests were highly efficient means of identifying students with low probabilities of success, that is, at establishing the threshold level, but were relatively unsuccessful in distinguishing between those who were most successful and those who were merely marginally successful. While the tests were able to give some prediction at Stage I of the course, they could not predict successful completion of the end of the first year of the apprenticeship.

> That this is so has long been the clearest outcome of most test-predictive studies of success in TAFE courses. That it should be so is not surprising either: in most contexts a minimal level of 'ability' is a necessary but not sufficient condition for success. Once having that minimal level, other factors such as interest, motivation, social pressure, and curriculum relevance become the determining factors. (Hawke, 1976a, p. 2).

This confirms the findings of Flanagan and Cooley (1966). Hawke's 'minimal level' of ability would be the threshold level. Hayes and O'Sullivan (1984) gave pre-course tests to 267 fitting and machining apprentices, and 135 electrical apprentices. The tests consisted of:

- IQ—Standard Progressive Matrices;
- Verbal Ability—MS Reading Test;
- Mathematics—QS Mathematics Test (Arithmetic, Algebra, and Geometry);
- Mechanical Reasoning—ACER Mechanical Reasoning;
- Work Attitude—PAYES Test (Program for Assessing Youth Employment Skills, consisting of WA1, WA2, WA3 and WA4).

[These tests are similar to those currently used by some TAFE Authorities to select pre-apprenticeship students]. For both groups the correlations were very low between the entry level scores and performance in an end-of-year practical test of skills taught during the first year of apprenticeship.

Table 2.2

PRODUCT MOMENT CORRELATION COEFFICIENTS OF PRE-COURSE TESTS WITH END OF YEAR PRACTICAL TEST

	IQ	READ-ING	ARITH-METIC	ALGEBRA & GEO-METRY	TOTAL MATHE-MATICS	MECHAN-ICAL REASON-ING	WA1	WA2	WA3	WA4
Fitting and Machining Apprentices	-.16	-.13	.05	-.03	.02	.02	.17	.02	.00	-.03
Electrical Apprentices	.02	.27**	.31**	.17	.25*	.08	.27**	.10	.00	.12

** P < 0.01 * P < 0.05

This confirms Hawke's (1976a) findings that paper and pencil selection tests are not successful at distinguishing between applicants above the threshold level.

Hill (1983), using a sample of 461 WA pre-apprenticeship applicants found Year 10 mathematics results a better predictor of course performance than the selection mathematics test. He stressed the value of the counsellor's role in advising on the implications of discrepancies in these two scores in individual cases. He criticised the use of test data alone to screen candidates who will appear before selection boards, as it is '. . . less efficient than a screen based on school levels.' (Hill, 1983, p. 4)

Davenport (1983) states (p.2):

> It is not simply a case of designing better tests, even if we had the resources. With regard to recent school leavers, it is precisely the non-cognitive content of school achievement which accounts for the predictive gain over tests, however reliable.

(Non-cognitive content includes effort, sociability, persistence and motivation.)

Holdgate (1983), examined existing vocational tests and their validation, plus available literature on vocational selection. She found:

- most aptitude tests and the research behind them are at least 20 years old;
- academic attainment as a predictor of future educational attainment has relatively high predictive validity;
- future apprentices are generally selected for performance in training courses, rather than attempting to predict their more distant future on the job, by which time changes in motivation and/or interest may affect their performance;
- school results in mathematics, English and science have been shown to have reasonable predictive validity for TAFE trade courses and are the subject areas of most interest to supervisors of apprentices.

Holdgate found no evidence that spatial perception or mechanical comprehension related to performance in TAFE trades courses, or on the job; the mechanical comprehension tests usually relate to learned skills to which boys are more likely to have access at school than would girls, and so these tests could be a cause of unfair bias against girls if used in selection.

However, Davenport (1982a, 1982b) found spatial perception a significant predictor of performance in cabinet-making pre-apprenticeship courses (r=.54), and for fitting and machining pre-apprenticeship courses (r=.42).

Hannon and Learmont (1982) found apprentices with poor literacy and/or numeracy had difficulty comprehending their course instructional materials.

They reviewed relevant research on apprentices' ability to read instructional materials and concluded that the level of instructional materials was generally above the reading ability of apprentices.

In the same study, Hannon and Learmont reviewed studies on the literacy and numeracy levels of incoming apprentices at Swinburne TAFE College, Victoria. They found that the three major areas in which apprentices were most likely to experience difficulties during their courses were reading ability; mathematical development and ability; and motivation. They administered a battery of tests to 61 first-year male plumbing apprentices. The tests used were:

- a personal questionnaire with an emphasis on socioeconomic and educational background;
- the Gapadol Reading Test;
- a Cloze Reading Test;
- a Mathematics Achievement Test;
- a Cloze Mathematical Reading Test.

The last three were developed from instructional material used by first-year plumbing apprentices.

(For a detailed description of these tests see Hannon and Learmont, 1982.)

Hannon and Learmont found:

- The Mathematics Reading Test and the Mathematics Achievement Test were the best predictors of performance in the first year of the course with correlations of 0.34 and 0.33 respectively. The Cloze Reading Test was next, (r=.27). Each of these three tests predicted performance significantly at the 0.05 probability level.
- The Cloze procedure was an appropriate method of testing both reading and mathematical reading and for predicting on-course performance.
- Reading tests used with an apprentice population should be based on appropriate instructional material to predict students' on course progress.
- Apprentices with a low concept of their academic ability were more likely to progress more slowly but would not necessarily fail more frequently than those with a more positive perception of their previous academic success.

Taylor and McNamara (1982) found performance in the Electronic Trade Apprenticeship Course (Semester 1, stage I) can be predicted from several at-entry measures. The best single predictor of theory was the mathematics test designed by the NSW Division of Basic Education (r=.49). This was only a marginally better predictor than the raw score of the Otis General Ability Test (r=.48). The Otis was the best single predictor of laboratory (r=.34) and practical work (r=.31). For all of these correlations P <.005. Previous educational attainment of school leavers was also a good predictor of all three. The authors caution that other factors such as motivation are also significant. However these predictors do indicate whether the student is very likely to pass the course, very likely to fail, or to fall somewhere in the middle.

Bucksath (1982) found that academic achievement in the first year of electronics trades courses correlated highly with achievement in a standard trade-level entrance mathematics test (r=.64, P<.005) and a standard reading comprehension test (r=.38, P<.005).

Martin (1982) administered a Cloze test of reading ability to 705 TAFE students, doing a variety of courses. He found those students who were assessed as being 'independent readers' (90% or higher comprehension) were the most successful students, and nearly 90%, succeeded in their courses. Those who were assessed as being at 'instructional level', that is, able to comprehend the course material if given remedial support, (between 75% and 90% comprehension) had about a 65% chance of passing the course. Of those categorised as being at 'frustration reading level', with less than a 75% comprehension, about 65% withdrew or failed. Those students who received remedial help were much more likely to be among those who passed the course.

Taylor (1983) administered a vocabulary test (Word Knowledge—Form C [WKC]), a general ability test (Otis Higher B) and a mathematics test to apprentices early in their first year of the Automotive Mechanics Trades courses. The results of these were compared with the students' average results on the eight modules that make-up the course.

Table 2.3

CORRELATIONS BETWEEN ENTRY MEASURES AND AVERAGE MARK

Test	r	P	n
WKC	0.624	.005	87
Otis Higher B	0.625	.005	87
Mathematics Test	0.652	.005	86
Highest level of education	0.406	.005	84
School Certificate Mathematics Grade	0.606	.005	72

Taylor found both prior academic attainment and the standard psychometric tests good predictors of success in the course. ($P<0.005$ for all of these).

Biodata

Taylor and McNamara (1982) gave electronics apprentices a list of problems that could arise during the course and asked apprentices to indicate if they expected them to occur. These were correlated with performance in the course. Students who anticipated trouble with particular subjects did significantly worse in theory ($P<.005$), while those who expected problems with language did significantly worse in practical work ($P<.005$). Taylor (1983) also found that students who anticipated problems were less likely to be successful in the course.

This shows that the students were capable of considerable insight into future problems. However, since these students were already enrolled, it is less likely that applicants competing for places on the course would be so objective, if this might lead to their exclusion.

Sixty per cent of small business sector employers surveyed by Malone and Sumner (1984) felt that school reports were of assistance in selecting applicants for apprenticeship. Of these, nearly three quarters found teachers' comments to be of positive value in selection.

School Achievement

Hawke (1976b), examined the predictability of Year 10 school results in Mathematics, Science and English for completion of electrical trades apprenticeship. He found a significant relationship between prior academic achievements, particularly in science, and successful completion of the course ($r=.29$). English correlated at $r=.07$ and Maths at $r=.13$. Hawke also found a compensatory effect—those students who were unsuccessful in any two of the three subjects had a considerably greater chance of success if they had passed the third subject, i.e. passing at least one subject indicates a threshold level of academic performance and students who were unable to achieve this had a considerably lower probability of succeeding in the course. School results are therefore significant predictors of course performance and can contribute to the information on which selection is based.

Upchurch (1979) found for electrical apprentices, that school mathematics achievement is positively correlated ($r=.33$) with later appraisals by employers of apprentices' on-the-job performance, and also ($r=.33$) with final year grades.

Taylor and McNamara (1982) in a study of predictors of performance in electronic trades courses found the student's highest educational attainment, school certificate mathematics, and school certificate English grades were all good predictors of course theory and practical work. For school leavers, past academic performance was a good predictor of performance in the course.

Wilson (1982) investigated Victorian employers' use of school-based assessment in employing 15 to 19 year olds. Of the 90 employers, 54% reported that they always considered educational records, and regarded them as very important; 6% always looked at the records but did not consider them a very important selection criteion, but used them to initially sieve applicants and as an aid in interviews; 35% reported they occasionally looked at applicants' educational records; and 6% reported they did not use them. Wilson suggests:

> . . . if methods of assessment and reporting can be developed to provide more useful and appropriate information about young people's educational experience and performance then this should facilitate and improve the recruitment of school leavers into the positions that are available. (p.3)

Apparatus tests

Glencross and other researchers in the Department ofPsychology at Flinders University, S.A., are currently developing apparatus tests which are based on the assumption that skilled performance may be better predicted from a variety of interacting cognitive and motor skills than from the simple sensory motor tasks traditionally used as predictors. Many skilled tasks require:

> . . the ability to quickly switch and focus information processing resources (orientation, attention, capacity) to the immediate contingencies of the task and to monitor and/or integrate a wide variety of inputs with minimum cost to the primary task. (Glencross 1981, p. 43).

This methodology could be used to develop selection tests for pre-vocational trades courses, e.g., tests of motor co-ordination and of an applicant's ability to carry out a number of functions at the same time under pressure of noise and time. Essential elements of a specific task could be isolated and these could be combined and varied to obtain measures of performance under varied conditions. Thus the components of the skills used in trades courses, and on the job, could be analysed and a candidate's performance on them tested.

Such tests could be devised in a format similar to television games; they would, however, be expensive to administer to large numbers of applicants.

Interest in area

Ainley and Fordham (1979) examined the reasons for cancellation of 6201 Australian apprenticeship agreements in 1978. The most commonly given reason was loss of interest (41%), while inability to cope with the technical course was listed by only 9%. They concluded that it is essential to ascertain that applicants for trades courses have an interest in the area, based upon knowledge of the job and working conditions in it. They stressed that candidates also needed insight into their own areas of interest to make sure these relate to the trade areas they have selected. Ainley and Fordham saw a need to test candidates' interests.

Trainability tests, by placing candidates in a situation where they perform tasks similar to those involved in the course or job, provide candidates with an opportunity to discover if they would enjoy that type of work.

Interviews

Wilson (1982) in a study of methods of selection by 19 employers, found all the employers interviewed school-leaver job applicants. This confirms the findings of Williams and Priest (1978), who found all employers included in their study (n=354) interviewed school leaver job applicants. Williams and Priest found all of the smaller enterprises, and 42.5% of the larger enterprises, (defined as employing more than 20 staff), used interviews as their sole selection method. Private employers, in particular, relied exclusively on a personal interview as the only method of selection.

Skill utilisation

O'Brien (1982) found skill utilisation, (i.e. the degree to which a job uses an employee's skills), was the strongest predictor of job satisfaction, while job satisfaction in turn significantly predicts turnover and absenteeism. He concluded that when an individual's job required those skills in which he/she is most competent, the individual is most likely to experience job satisfaction. Therefore, tests of candidate's ability to perform the skills required on the job could predict their future job satisfaction.

This in turn is related to performance on the job. Valid predictors of long-term interest in trade areas would be a valuable component of selection batteries.

2.3 SUMMARY

Aptitude tests, many of which were developed and normed in the USA more than twenty years ago, are still frequently used in Australia. They are often efficient predictors of threshold level but tend to be poor at predicting which candidates, above the threshold level, will do best on the course or on the job, i.e., many are not valid predictors of entry level (Holdgate, 1983).

Similarly, there is a threshold level for both reading and mathematics achievement below which it is unlikely a student could cope with the demands of either the course or the job. However, the amount by which he or she exceeds this threshold may be irrelevant to the young person's performance in the course or on the job, i.e., if a student can read the instructional materials or a tradesperson can take accurate measurements, where such people stood in relation to other applicants on a pre-employment reading or mathematics selection test may be of no importance, and in that case should not be used to distinguish between applicants at entry level.

However, two other methods of selection; work sample tests including trainability tests, and biographical data, have been found better predictors of performance, both in training and on the job in American studies, e.g., for welding pre-apprentices, Gordon and Cohen (1973);

motor mechanics, electrical and electronic apprentices, Schmidt et al. (1977); and many different areas, Asher (1972).

However, trainability tests usually involve a high initial capital outlay. This is one reason why they have not been used extensively in Australia. They are also more expensive to administer than most paper and pencil tests which can be given to large groups simultaneously. However, excluding trainability tests from the selection battery may be just a short-term saving for if these tests are better predictors of performance on the course and the on the job, longer-term savings may be made because of reduced drop-out rates and more competent trades people.

Candidates tend to prefer work sample tests rather than paper and pencil tests as they have greater face validity and therefore appear fairer and more appropriate. However, they are specific to particular trades areas. In some States selection is for one course which may lead to credit in up to nineteen different trades, however, candidates may wish to be considered for several courses in quite different trades. It would be impractical to test applicants with tests which are specific for all trades in which they could, potentially, enrol. Candidates will usually have a particular interest in one or just a few specific areas which could be tested.

The applicant's interest in, and knowledge of, the trades—both the actual processes and working conditions—are highly correlated with completion of an apprenticeship. This could be predicted from biographical data.

Students' perception of their own potential problem areas is often quite accurate, however, candidates for places on courses might not be objective in their self analysis. Verifiable biographical information is therefore perferred.

School results have been found a good predictor of future performance. There are problems of compatibility between raters, both within and between schools when school reports, results and references are used but these problems could, to some extent, be lessened by providing schools with a standardised rating form with clear guidelines.

Williams and Priest (1978) suggest that as well as the school report, which is designed for the school leaver and his or her parents, a separate type of reporting document be developed which would provide information geared to employment requirements.

Wilson (1982) found about 50% of employers wanted applicants' educational certificates to include information concerning the school-leaver's ability in written and oral communication, numeracy and attitude. Employers' most frequently given reason for finding school reports helpful was that they were interested in teachers' comments concerning attitude and ability. Many employers wanted the format of school reports to be standardised across schools.

Skill utilisation is also highly related to job satisfaction. Skills involved in a particular trade could be analysed and the elements which make them could be tested, using a development of the 1940s apparatus test. This is another area for possible future development.

Table 2.4

RESEARCH FINDINGS

PREDICTIONS FOR SPECIFIC TRADES, CORRELATED AGAINST COURSE OR ON THE JOB PERFORMANCE.

Trade	Researcher	Predictors studied	Significant Predictor	Probability Level or Correlation
AUTOMOTIVE	Pucel et al., 1972, USA	. General Apptitude Test Battery (GATB)	Yes	P < 0.05
		. Minnesota Vocational Interest Inventory (MVII)	Yes	P < 0.05
		. Sixteen Personality Factor Questionnaire (16PF)	No	-
		. Minnesota Importance Questionnaire (MIQ)	No	-
		. Vocational Development Inventory (VDI)	No	-
		. Minnesota Scholastic Aptitude Test (MSAT)	No	-
	Taylor 1983, NSW	. Biographical questionnaire including prior highest level of academic attainment	Yes	0.41 P < 0.005
		School Certificate Mathematics grade	Yes	0.61 P < 0.005
		. Vocabulary Test Word knowledge-C	Yes	0.62
		. Otis Higher B	Yes	0.63 P < 0.005
		. Mathematics selection test	Yes	0.65 P < 0.005
		. Standard Psychomotor tests	No	
ELECTRICAL	Purcel et al., 1972, USA	. As in Pucel above	Yes	P < 0.05
	Hawke, 1976a, NSW	. Otis Verbal Reasoning Test	All signfiicant at the threshold level but not at selection level	
		. ACER Silent Reading		
		. WKC Vocabulary		
		. Mathematics Attainment		
	Hawke, 1976b NSW	School results in:		
		. English	Yes	0.07
		. Science	Yes	0.29
		. Maths	Yes	0.13
	Upchurch, 1979, Tas.	. School mathematics achievement	Yes	0.33
	Hayes and O'Sullivan, 1984, Vic.	. IQ Standard Progressive Matrices	No	
		. Verbal Ability MS Reading test	Yes	0.27 P < 0.001
		. Mathematics QS test	Yes	0.25 P < 0.01

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Table 2.4 Continued

Trade	Researcher	Predictors studied	Significant Predictor	Probability Level or Correlation
		. arithmetic component of Mathematics QS	Yes	0.31 P < 0.01
		. ACER Mechanic Reasoning	No	
		. PAYES Work Attitude tests	Part I only	0.27 P < 0.001
	Hill, 1980, WA	. Year 10 Mathematics	Yes	0.71
		. ACER Verbal Reasoning	No	
		. Spatial perception test	No	
		. WA Arithmetic test	Yes	0.69
FITTING	Hill, 1981a, WA	. Year 10 Mathematics	Yes	0.45 (Phi)
		. ACER Quantitative Reasoning	No	
CARTOGRAPHY AND SURVEYING	Hill, 1981b, WA	. Overall education level	Yes	0.55 (Phi)
		. Year 10 Mathematics	Yes	0.62
		. ACER Verbal	No	
		. ACER Quantitative	No	
		. WA Mathematics Attainment Test	No	
CABINETMAKING	Davenport, 1982a, WA	. Year 10 English, Mathematics, Science, Social Studies, Woodwork, Tech. Drawing	School Mathematics Only	0.52
		. ACER Verbal	No	
		. Spatial perception	No	0.54
		. WA Arithmetic Test	No	
WELDING	Pucel et al., 1972 USA	. as in Pucel above	GATB only	P < 0.05
	Gordon and Cohen, 1973 USA	. Work samples	Yes	0.69
ELECTRONICS	Bucksath, 1982, NSW	. Standard entrance battery for pre-vocational courses	Mathematics test Reading comprehension	0.64 P < 0.005 0.38 P < 0.005
	Taylor and McNamara, 1982 NSW	. Anticipated problems (self rated)	Yes	P < 0.005
		. Biographical questionnaire	Academic attainment	
		. WKC	No	
		. Otis higher B . Mathematics ability test	Yes	P < 0.005
		. Standard psychomotor tests	No	

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Table 2.4 Continued

Trade	Researcher	Predictors studied	Significant Predictor	Probability Level or Correlation
METAL TRADES FITTERS AND ELECTRICAL APPRENTICES	Smith and Downs, 1975, UK	. Trainability tests	Trainability tests found to be good predictors for short time only	P < 0.05
FITTING AND MACHINING	Hill, 1981C, W.A	. Overall education	Yes	0.66
		. Year 10 Mathematics	Yes	0.66
		. ACER Verbal and Quantitati.e	Quantitative	0.57
		. WA Arithmetic Test	Yes	0.68
	Davenport, 1982b, WA	. Year 10 Mathematics	Yes	0.60
		. ACER Verbal and Quantitiative	No	
		. Spatial perception	Yes	0.42 0.66 with year 10 mathematics
		. Mechanical Reasoning	No	
		. WA Arithmetic Test	Yes	0.56
	Hayes and O'Sullivan, 1984, Vic.	. IQ Standard Progressive matrices	No	
		. Verbal Ability MS Reading test	No	
		. Maths QS test	No	
		. ACER mechanical reasoning	No	
		. PAYES work attitude test	No	
PLUMBING	Learmont and Hannon 1983 Vic.	. Personal Questionnaire	No	
		. Gadadol Reading test	Yes	0.27
		. Mathematical achievement	Yes	0.33
		. Mathematical Reading	Yes	0.34
REVIEW	Asher, 1972, USA	. Biographical data	Yes	55% of predictors based on biographical data had a validity coefficient of 0.50 or higher with job proficiency
		. Intelligence tests	Significantly lower predictive validity than biographical data	
		. Aptitude tests		
		. Interests tests		
		. Personality tests		
REVIEW OF MANY DIFFERENT WORK SAMPLES TESTS INCLUDING MOTOR MECHANICS, ELECTRICAL, ELECTRONICS	Asher and Sciarrino, 1974, USA	. Work samples	Yes	P < 0.01
		. Biographical data	Yes	P < 0.01

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CHAPTER 3

DESCRIPTION AND CRITIQUE OF CURRENT AUSTRALIAN SELECTION FOR PRE-EMPLOYMENT COURSES

Information was obtained from a number of persons selecting students for pre-employment courses in each State or Territory. The methodologies described are those in use at the time of writing, that is July, 1984. In some States and Territories only one method of selection was used; in others it varied between metropolitan and country colleges and in others from college to college.

For each TAFE Authority the most generally used method of selection is described, and variations from this are noted. However some methods of selection used for only a few courses may have been omitted.

3.1 NEW SOUTH WALES

Advertising

The NSW pre-apprenticeship and pre-employment courses are well advertised. Each college which presents a course places advertisements in the local press; the central office also places advertisements in the two major daily newspapers. Advertisements are run on those radio stations which are most popular with young people.

TAFE runs an inservice course for high school counsellors to familiarise them with TAFE courses. All high schools are provided with posters and leaflets. These are available in 24 different languages on request. During the information period before selection, bilingual information officers are placed at colleges which serve ethnic areas.

All leaflets and posters are checked to ensure they are non-sexist, and efforts are made to attract girls through the use of special posters.

The Aboriginal Education Unit initiated some pre-vocational courses specifically for Aborigines in 1984.

Methods of Selection

NSW TAFE is faced with the problem of selecting from thousands of candidates for limited places. Many applicants apply for courses in more than one pre-vocational area, and an attempt has been made to devise one battery of tests to select students for all courses, in order to reduce the need to retest applicants for more than one course. This, however, creates the problem that some tests lack face validity for some courses, and unsuccessful applicants sometimes feel they have been tested unfairly, for example, the wire-bending test of manual dexterity, see below, lacks face validity when used in selecting pre-apprenticeship cooks.

Physically disabled students may request modifications in the selection procedure if necessary.

In an attempt to standardise selection methods, the battery of three tests which has been used since 1980, was, in 1984, administered by videotape. This was a pilot study of this technique; however it is to be discontinued because of the high cost of providing sufficient videotape equipment for all the colleges where testing occurs.

Pre-vocational selection in 1984 was based on four different selectors, three tests and an interview:

Comprehension of technical instruction

Four lessons were administered on videotape. They were devised in 1979 to be broadly representative of the areas of pre-vocational courses which were available at that time. They consisted of: operation and repair of a hose tap; nature and preparation of concrete; pulley systems; and lift and force pumps. Each lesson varied in length, and was followed by a multiple-choice questionnaire of comprehension. Although this test does measure an individual's ability to comprehend technical instruction, it is not measuring the practical application of that information, and thus differs from trainability tests. There is also the problem that the lessons lack face validity for some courses such as hairdressing.

Manual dexterity

Candidates first received instructions by videotape, and then were required to bend two pieces of wire to pre-specified shapes. This is not a trainability test as the instructions given in no way replicate a lesson in the course. Course teachers have reported informal findings of correlations between this test and first-year results in both the practical and drawing components of all the pre-apprenticeship courses, even where it has a low face validity as in hairdressing. This suggests that it is testing manual dexterity. However, the samples involved were small; so these results can only be taken as indications until further research is undertaken.

This test is very similar to one used in a battery of apprenticeship selection tests by BHP at Whyalla. Using Whyalla apprentices, McGurk (1979) found the test had a significant positive correlation with first-year results in drawing for fitters and turners, but not for boilermakers or electrical mechanics. McGurk concluded 'This indicates there is no predictive value attached to the Wire Bending task <u>for this sample of apprentices</u>' (McGurk, 1979, p.3). Further research is necessary to establish the validity of this test. It has the advantages of economy and ease of administration to large numbers of candidates, and face validity for many trades areas.

Mathematics

This test is based on, but goes beyond, School Certificate Mathematics '. . . so as to better differentiate between the more able students' (TAFE Newsletter, March, 1984). The better the applicant performs on this test the better he or she performs on the course, however, the predictive power diminishes as the test score increases.

There is no specific test of reading in the battery, but in order to pass the 'four lessons' in the comprehension of technical instruction test a candidate would need some reading competence. The mathematics test is introduced by videotape, but is actually a written paper with problems to solve which require ability in reading and comprehension as well as mathematics, e.g., 'Which is the best approximation of the angle indicated in the diagram?'

However, the tests may not be a good measure of the candidate's ability to read and understand the written and verbal components of the course and the job.

Marks are given for these three tests. There is a minimum cut-off point below which candidates will not be considered for the courses. Students are ranked according to their test results and, starting from the top, sufficient candidates to fill the classes, plus about 25%, are interviewed. This means that many applicants who meet the basic requirements are excluded at this stage, and it is questionable whether the three tests have actually selected the most suitable applicants—there has not yet been a measure of interest or motivation as recommended by Ainley and Fordham, (1979).

Interviews

When females are interviewed, there must be a female on the interview panel. Similarly, if an Aborigine is interviewed, there must be an Aborigine on the panel. No quotas have been set for Aborigines, but every effort is made to place Aboriginal applicants.

The guidelines for the interview stress that its function is to assess the applicant's interest and motivation, not his or her language or expression. The average length of the interview is 5 to 10 minutes.

There are eight questions the interviewers must ask; these can be paraphrased or re-ordered:

1. Why have you applied for this course?

2. How did you learn about this course?

3. What sort of job would you expect to get when you finish?

4. What sort of work would you do in that job?

5. What sort of tools or equipment are used?

6. What sort of things do you think you'll learn in this course?

7. What sort of hours do tradespeople in this type of job work?

8. Is there anything else you think we should know about you?

Candidates are advised, during the testing session, that if they are unsuccessful in their application to join the course, they can obtain vocational counselling through the college counselling service.

Positive discrimination

NSW TAFE has a policy of aiming to achieve a quota of at least 10% female participation in each pre-apprenticeship course. As one way of achieving this there is positive discrimination towards girls. Thus any girl who passes the minimal cut-off point in a non-traditional area will be interviewed and accepted on the course, until the 10% quota is reached. Females would compete equally with males for the remaining places.

This means that a male candidate who has performed better than a successful female candidate may not be accepted, this, in turn raises the question of equity.

Terminology

From 30 July 1984, the term 'pre-vocational courses' will be used in a generic sense for full-time trade courses, in which the students have not yet commenced employment. They include Industrial Skills Development Courses, Pre-apprenticeship Courses and Pre-employment Courses. The last two are the types of courses considered in this paper.

These courses will be described in the TAFE Handbook—1985:

> b) Pre-Apprenticeship courses offer education and training in specific trade areas. The most widely offered are the pre-apprenticeship courses which are usually of one year's duration. Most cover the first two stages of a single trade course ("Mono") or the first stage of two trade courses ("duo" [sic]).
>
> c) Pre-Employment courses—these courses are broad-based trade training programmes which introduce students to a wide range of skills and then extend the training into one or more specific skills areas.
>
> Circular by J. L. White, Deputy Director-General (Educational Developments) 30 July 1984.

Modifications for 1985

In 1985 selection for pre-vocational courses will be based upon only three tests which will be:

1) The manual dexterity test described above; however instructions will be presented in a written form as the videotape presentation has been discontinued.

2) The mathematics test described above which has been slightly modified.

3) An English test which consists of two parts: one section of synonyms which includes, but is not exclusively of, words tradespeople might encounter in their work but which are not

specifically trades terms. The other section consists of two passages of comprehension with multiple-choice questions. To avoid sexual bias the passages are about non-sexual stereotypic trades—pottery and sandal making.

The interview will no longer be used in selection for pre-apprenticeship courses. This is because interviews generally have not been found to be valid predictors of success, and as they are very expensive both in terms of time and money, it was felt that they were not cost effective. However, they will be retained for pre-employment courses, but will contribute little towards selection; instead, they will be used to discuss possible career options with students as these courses introduce students to a wide range of trades areas.

3.2 VICTORIA

Pre-vocational courses

Approval for accreditation for pre-vocational courses in Victoria was granted in 1984 by the Industrial Training Commission of Victoria, after two courses were trialled in the first half of 1984. These were bricklaying, which was trialled in three colleges and will continue to be offered at these, and carpentry and joinery which was trialled in two colleges and will now be offered in ten colleges. The requirements of industry have been an important consideration in developing these courses and in deciding on the selection method.

Bricklaying pre-vocational course

The bricklaying course is a 16-week course, with 6 months credit off the indenture period and two years credit granted towards the TAFE course. As graduates of the course commence on the first-year apprentice wage they are attractive to employers.

Advertising

Advertisements were placed by the Master Builders Association as this course is an industry initiative scheme. Advertisements were placed in 3 newspapers, once only in each. No reference was made to female participation and no girls applied. There was no advertising in ethnic languages. There were 60 replies to the advertisement but only 25 people came to the selection day. The advertisements did not give much detail and there are plans to improve this in the future.

The CES was deliberately not used in recruitment as it was feared that such applicants would be 'bottom of the barrel'. Most of the applicants were school leavers, while some were still at school and left to do this course.

Testing

Tests used were of reading and mathematics—they were devised by staff at Victorian TAFE colleges and have not been validated against the course or on-the-job success.

The reading test is a 50 item test—the items are general, not trades based. The mathematics test consists of 21 items testing basic mathematical areas.

Results of these tests would be used to form a short list if there were many applicants. School results and academic level obtained will be considered in selection for future courses and details of academic level will be requested on the application form.

Interview

Those applicants who did well enough on the tests to be considered for the course were interviewed, that is, the tests were used to screen out applicants below the threshold level. The selection panel consisted of one representative of the unions and/or employers, one person from the TAFE Board and one member of the teaching staff. They explained what the course involved and asked about the applicant's interests. There were guidelines with rating scales for the interviews. Five different aspects of the candidate are considered at the interview, and each is assigned an equal weight:

- physical attributes—both personal presentation and physical suitability for the job;
- attitude/personality—maturity; attitude to school, work, society; reaction/responses to interview; alertness;
- trade awareness—knowledge of the job, family involvement in the trade; reasons for entering the trade;
- work experience and appreciation of the work ethic;
- hobbies, personal interests—clubs, sports, home workshop, travel.

Carpentry and joinery

The other pre-vocational course run in Victoria in 1984 was in Carpentry and Joinery.

Advertising

There was no advertising in the press for this course as even without this there are far more applicants than places. The course is promoted through industry and union newsletters to try to attract sponsorship and employment of students. Many employers refer applicants they cannot sponsor, to the course.

However this means that young people who have already left school and who may have been eminently suitable for the course are denied the opportunity of being considered if they have no contact with employers. This would seem to be placing administrative convenience (fewer applicants to test) above equity of access.

Careers teachers in schools are given a lot of information about the course by the Victorian Building and Construction Industry Training

Council. The two TAFE colleges liaise with schools and industry. There is a conscious effort to attract the type of applicant industry would want, that is, the male school leaver. There is no advertising designed to attract female participation nor is information available in ethnic languages. Girls are made aware, during the interview, of the drawbacks such as dirty, heavy work.

Selection

There are two ways of entering this course—either by direct, competitive entry, or by sponsorship, whereby an employer guarantees the young person an apprenticeship on completion of the pre-vocational course. Sponsored applicants must sit the same entrance tests as others, and their results are sent to the sponsoring employer. However, all sponsored applicants are given a place on the course, regardless of their test results.

Tests

The selection process occurs in two parts:

1. A joint test of mathematics and of equipment identification. This test is owned by the Master Builders Association MBA and is used as a measure of threshold suitability for the course.

   Staff at Victorian TAFE colleges were asked which areas of mathematics were relevant to their courses and from this a test was devised. It is not equivalent to any particular year level at school and has not been validated, but is very well accepted by industry; employers believe the right students are being selected for the course. As there is a group of students who did not pass the test but were accepted for the course as students sponsored by industry, it is possible to study the validity of this test. Ninety per cent of the marks are given for this part of the test.

   The other ten per cent is given for tool identification. There is a cut-off point of 7 for this test, below which applicants will not be considered for the course irrespective of their maths score (i.e. applicants must have correctly identified seven of the ten tools).

   The equipment identification part of the test is regarded by the Master Builders' Association as a test of interest. They believe that if applicants are genuinely interested in the field they will have had workshop experience or have looked at tools in shops. However, this type of test has been questioned as a predictor of future success either in the course or on the job by Equal Opportunity Officers as it is a test of current knowledge which may unfairly discriminate against those who have had less access to workshops (e.g., girls).

2. Cloze reading tests, a trainability test and the interview.
   Those applicants who have passed the threshold level are called in again for further tests and an interview. Approximately twice as many applicants as there are places, are recalled. They are given a Cloze reading test of two parts, one of which has every-

day content and one which uses extracts from text books students would use on the course. This test needs further development and validation to ascertain that it is indicating which students would have difficulty with the individualised written materials used in the course. Tests of reading must measure the applicants' ability to follow instructions both written and oral, as both will be required on the course and on the job, and to comprehend safety instructions. Key words from all these areas are needed in a Cloze test of reading but have not all been included in this test.

The second test is practical and is the only Australian selection test which approximates Robertson and Downs' criteria for a trainability test (see above pp13, 14). However, the instruction and demonstration are not standardised as the applicant may ask questions during the test; nor need the task be done unaided, the applicant may ask the instructor for assistance.

This test, which was devised by staff at Holmesglen TAFE College, has not yet been validated. However, teachers have observed that applicants who did well on this test do better in the course than those sponsored students who did poorly on this test. Formal validation studies of the test would be worthwhile.

The test takes approximately one and three quarter hours and is administered in groups of eight applicants to one examiner. This enables the examiner to record his observations of the students' work methods during the test, on a rating sheet. Marks are given for work organisation, diligence, measuring and marking, co-ordination, plan reading, housekeeping, (that is, tidying up afterwards) and tool use of plane, tenon saw, chisel and marking gauge.

Each of these ten factors is given a mark out of ten to form the final score. The applicant's previous experience is considered in this evaluation. Candidates are each given a piece of wood on which they are to measure and mark out from an illustration on a sheet of paper. The requirements are also written on the board and there is a completed model for them to copy. Set out lines placed at 90^{o} and specified angles to a given side are required, together with the operations of gauging, sawing and chiselling.

Each operation is demonstrated by the examiner who assumes no prior knowledge of the skills. He is available throughout the test to answer questions and assist the applicants. This aspect of the test is not, therefore, standardised but is considered by the examiner when rating the applicant.

This is followed by an interview of approximately 15 minutes. The interview panel consists of a TAFE teacher, a union representative and an employer, and occasionally there is an observer from the Industrial Training Commission. The three interviewers individually rate each applicant on a standardised interview marking schedule which is the same as that used to rate students for the Victorian bricklaying pre-apprenticeship course (see above). The three raters' marks are combined and averaged for each applicant.

Final selection of students is made on the basis of the total marks scored on these two tests and the interview.

Applicants for the courses are addressed by industry, TAFE and Industrial Training Commission representatives so that they will have a realistic conception of what the course involves.

3.3 QUEENSLAND

Advertising

Potential students are made aware of the courses by a general newspaper advertisement, plus careers evenings held at TAFE colleges. These career nights are advertised in newspapers, radio, and television. There are posters showing girls in non-traditional trades areas, in an effort to encourage girls to apply.

Information, including leaflets and enrolment forms, is sent to every high school, private and public. No information is provided in ethnic languages.

Selection methodology

Queensland pre-vocational courses are designed to introduce students to a family of trades—the most frequently run course is pre-vocational Engineering and Construction which can give credit in 19 different trades courses. This makes specific selection methods such as work samples less appropriate.

However, a subset of tests related to specific trades could be devised. From these, applicants could select the one in the trades area which most interested them and be tested on this. Many applicants would already have an area of interest, others could make a choice but they would not be bound by this. Students would still remain free, as now, to make a later choice of the area in which they wished to specialise, after they had completed the early parts of the course which introduce them to a wide variety of trades.

In Queensland, all metropolitan selection is done by South Brisbane TAFE so that selection will be consistent and students can be directed to the most appropriate college.

Selection is based on secondary school results. Classes are filled by looking first at those applicants who have completed year 12, then Year 11 and then Year 10. The greatest weight is put on mathematics scores as these have been found to be the strongest predictors of course success, followed by science, and English. If students have studied manual arts this is in their favour. Students list their interests on the application form and these are also considered.

Only 'grey area' students are interviewed to see if they have a real interest and background in the area.

Some places are given as 'special entry' at the discretion of the college principal.

Country centres make their own selections, based on the same formula; but having fewer students, they sometimes interview all prospective candidates.

The Queensland Department of Education, TAFE Division, Curriculum Branch made a detailed investigation of t e 1979 student population's on-course performance and found significant statistical differences ($P<0.001$) between students who completed Year 11 or Year 12 and those who only completed Year 10, while those who had completed Year 10 performed better than those who had not ($P<0.001$). However, there was no significant difference in performance in the course between students who had completed Year 11 or Year 12.

Year 10 school results in advanced mathematics, woodwork, metalwork and technical drawing all correlated significantly with success in the course, with correlation coefficients between 0.39 and 0.48. As the students were extremely homogeneous in their school results, (305 of 760 students had a combined point score in English, science and mathematics of 10 or 11 points), these low correlations are quite significant. Therefore, performance in these school subjects is regarded as an important component in selection of pre-vocational students.

Students who have not achieved well at school may be offered a place in a course which is similar to pre-vocational Engineering and Construction but which also provides remedial assistance. The final examination for this course is the same as for the Engineering and Construction pre-vocational course.

Using school results as the basis of selection has become more difficult as a greatly increased variety of school courses, of differing standards, has become available, and comparability of different courses at different schools is very difficult to establish.

Queensland is the only TAFE Authority to use school results as the major means of selection. Research has repeatedly shown that the best predictor of future performance is past performance. School results, if comparable between subjects and between schools, are a measure of past performance. However, it is questionable whether academic results alone will predict which candidates will perform best on the course, and later on the job. Research has shown that other factors such as practical skills, motivation and interest are also important contributors to success.

In Queensland it has been recognised that there is a need for a wider basis for selection, and selection methods there are presently under review.

3.4 WESTERN AUSTRALIA

Overview

In Western Australia pre-apprenticeship courses are an official alternative form of first-year apprenticeship training. At the end of their course most pre-apprenticeship students must sit the same end of

year tests as first year apprentices. Therefore, students are selected on the same basis as apprentices, i.e., their estimated potential as tradespersons, rather than in terms of their personal needs. There is no special consideration for any under-represented group.

Advertising

There is a limited amount of advertising in the press, but none on television or radio. The promotional campaign occurs predominantly in the schools where leaflets and application forms are distributed. TAFE counsellors visit schools and use slides and tapes to inform students and careers teachers about the courses. The slides include pictures of women in non-traditional trades areas. The 1985 leaflet cover will show a variety of trades, and females will be shown prominently. None of the advertising or information is in ethnic languages.

Application forms

Applicants complete an application form which asks for details of schooling and employment. Applicants must have completed, or be completing, Year 10. Very few applicants are screened out on the basis of this, but it does form a threshold level selector, since any candidates whose education level is too low for them to have a reasonable probability of coping with the demands of the course or job can be excluded at this point.

Testing

Selection for the metropolitan area is done centrally at Counselling Service Head Office, and at country centres using the same procedure. Responsibility for selection rests with the Counselling Service, whose professional staff are registered psychologists.

The selection process consists of:

1. A questionnaire requesting personal and educational details, and information about health, hobbies, interests, work experience and jobs held.

2. Four tests:

   a) Verbal Intelligence modified from the ACER SL test;

   b) A WA devised test of arithmetical ability. It is based on the trade calculations used during the pre-vocational course plus general arithmetical skills.

   c) An object visualisation space and form test.

   d) The Sweet Test of Technical Information—the predictability of this test is questionable. In WA it is being validated, and a candidate's results are not used in selection.

Results of these tests are compared with norms developed from results obtained from Western Australian apprentices. The norms are adjusted each year to include the current crop of applicants. This makes the interpretation of scores far more meaningful than when they are compared with norms derived from other countries or other age groups.

Dental technician applicants who have scored well in the tests, and have passed the interview, sit for a three-hour Dental Practical Test, and a physics test normed on dental technician pre-apprentices.

Interview

All applicants are then interviewed. This is to give vocational counselling to those who are not selected, as well as to produce a pool of 'suitable' candidates. From these the counselling staff identify those who will recieve a first round offer, and those who well be placed on a 'reserve' list. There is a guide for interviewers listing the characteristics required for each trade, for example, age, educational level, relevant hobbies or interests, particular health requirements such as absence of back injuries, and personality characteristics such as self reliance and responsibility. These characteristics were suggested by employers and lecturers.

The main functions of the interview are:

- to verify the data given on the application form and the questionnaire;
- to look for anything which might disqualify the applicant from doing the course, such as a serious physical condition which might prevent the applicant becoming a competent tradesperson, (thus, it is a threshold level selector).

Final selection is by a senior counsellor, often in conjunction with a senior lecturer (trades), and sometimes with industrial representatives (as with Plumbing in 1983 and 1984), using test results, details of student's background and the interview results.

Community Colleges

In WA there are three community colleges which, although not part of the TAFE system, run pre-apprenticeship courses. These are at Karratha, Kalgoorlie and Port Hedland. They determine their own selection methods, although from 1985 they may be using the selection method designed by the TAFE Counselling Service in order to increase comparability between courses.

3.5 SOUTH AUSTRALIA

Advertising

Advertisements are placed in the major newspapers and some local newspapers. Care is taken to stress that the courses are open to

girls. This is done at the beginning of the advertisements. Advertisements are referred to the TAFE Equal Opportunities Unit before publication. The advertisements are not aimed specifically at under-represented groups and no advertising is currently provided in ethnic languages. The Industrial and Commercial Training Commission, and the Department of Labour strongly promote the courses to employers.

Information, including leaflets, is provided to every secondary school, State or private, in South Australia, and also to CES officers, and other groups or organisations which run projects of courses for unemployed youth, in order to inform as wide a variety of young people as possible.

A large poster, slide package, and videotape are being prepared to advertise the courses. Large numbers of secondary students visit the TAFE Information Centre in school groups.

Methods of selection

The South Australian pre-vocational courses application form does not ask for information about school results or previous experience. There is no selection at this point. All applicants are tested. There are different methods of selection for different courses, but an interview always forms part of the selection process.

For the Hairdressing and Beauty course there are two separate interviews, as there is a very large demand for only a small number of places. Interviews have been found the best means of selection both in terms of success in the course and acceptability to employers. The first interview is a short one to screen out applicants who do not reach threshold level.

College devised selection tests

Applicants for the following courses are given reading and mathematics tests by the relevant colleges:

- Baking Industry;
- Commercial Cookery;
- Gardening Careers;
- Hospitality.

These tests have been devised by college lecturing staff in conjunction with industry, are based on on-course requirements, and vary from college to college. They have not been validated.

There is no separate threshold testing for these courses. Applicants are ranked on the tests and interviews, and classes are filled starting from the top. Selectors are instructed in the 'Notes on Selection of Pre-vocational Students for Interviewers' that those candidates who do not do well enough in the tests or interview to have a reasonable chance of success in the course are not to be included, i.e., this becomes a threshold test as well as a final selection level test. However, in practice some presumably unsuitable applicants have been enrolled in courses where classes would not have been filled.

The concept of the threshold level needs to be clarified for selectors.

Applicants for the Fashion Careers Course are given a preliminary counselling session where the aims of the course are discussed. They do a battery of college-designed, unvalidated tests including mathematics (based on the needs of the course), knowledge of current fashion (to estimate their interest in the fashion industry), and use of a sewing machine. Applicants are invited to bring samples of their work to the interview. The courses are always filled, starting with those applicants who performed best overall on the tests and interviews. No threshold level is set 'to give kids a chance'. College staff have expressed a need for valid measures of motivation.

There were five hundred applicants for 24 places in the Hairdressing and Beauty course. Work experience in the area, or attendance at a link course in hairdressing (which is made available to rural students as well as to city school students) was a significant factor in selection for this course. The ACER Numeracy Test, and the ACER Reading Comprehension test, both Year 10 level, were used, but found too difficult for the applicants and had very little correlation with the interviews so they were not given very much weight in the selection decision. Both interviews were conducted individually by members of the industry, or college staff, and formed the major factor in selection. The first interview was short, 8 to 10 minutes, during which the applicants wrote a resume or answered questions on why they wished to do the course, what it would be like to work in the industry, their work experience, and hobbies. All applicants were given the initial interview.

Candidates who were considered unsuitable at this point were excluded from the lists.

A second, longer interview was given to thoses candidates who were short listed. The applicant's self presentation, ability to adapt to others, and willingness to learn were gauged from the interviews.

College staff expressed a need for a suitable psychomotor test to be used in the selection of students for hairdressing and beauty.

The South Australian Government aptitude test battery, and the TAFE standardised interview

This battery of standardised tests is administered by the Department of Labour to candidates for places in the following courses:

- Automotive Mechanics;
- Electrical/Electronic;
- Metals Trades;
- Building (Wet Trades);
- Wood Trades;
- Paint Application;
- Multi Trades.

It is followed by a standardised interview. The test battery consists of tests of reading and mathematics plus the Sweet Technical Information Test (STIT) and the shorter form of the Minnesota Multiphasic Personality Inventory.

These are the same tests that are used for public sector apprentices. This battery has gradually evolved, and adaptations have been made but not validated. The whole battery is currently under review. Test results will be validated against success in apprenticeship and on the job. At this stage, large-scale testing in South Australia is restricted to paper and pencil tests.

The STIT tests a candidate's current technical knowledge and may reveal past interest in the area rather than predicting future trainability. It has also been criticised as discriminating against girls who might have had less access to workshops than boys. However, the test manual provides separate norms for males and females and these are used by SA TAFE to prevent any such discrimination.

On the results of these tests, most students either pass or fail the threshold level. Those who have not reached the threshold are excluded at this point, but are offered vocational counselling by TAFE counsellors.

Those who pass the threshold level, plus any applicants about whom the selectors feel uncertain, are interviewed.

Interview

It is expected that applicants bring their latest school leaver statement to the interview, and academic results and teachers' comments are considered. From 1985 these statements will be requested when the applicants are notified of an interview.

Interviews are standardised and take up to thirty minutes.

The Notes on selection of pre-vocational students for interviews state:

> An applicant who has performed satisfactorily in the aptitude test but shows no interest in any industry group will not be selected. Similarly students not selected for their first choice will only be offered their second choice if the interviewer/s have been convinced that they are genuinely interested in and suitable to the industry.
>
> It is emphasised that only those who are deemed suitable to the industry and likely to succeed in the course will be selected. Note: It is not a criteria to fill courses.
>
> . . . The interview should:
>
> 1. check choice;
>
> 2. check aptitude results;
>
> 3. check readiness to undergo pre-vocational course;
>
> 4. rate students by assessing:
>
> 1) motivation,

2) relevant previous studies,
3) trade knowledge/interest,
4) hobbies/interest,
5) personality/ability to relate to others,
6) presentation.

(South Australian Department of Technical and Further Education Notes on Selection of Prevocational Students for Interviewers. Pages 1 - 2).

Each factor is defined in the Notes for Interviewers, and rated 1-5 on a standard sheet. In 1984 this interview format is not compulsory and this will be reviewed for 1985.

Interviews are organised by course, not by college, and teachers from two or more colleges may be on the panel. It is TAFE policy to encourage industrial involvement on the selection panel, and the extent of this varies with different courses. SA TAFE is planning inservice courses to upgrade interviewers' techniques.

For some courses interviews may include an oral test. These are usually devised by staff working in the area and are not validated.

The interview also acts as a 'threshold' test and those candidates who are considered unsuitable are screened out at this stage.

Applicants are ranked on their combined interview and test results and the classes filled from the top. The selection level cut-off point is reached when either the class is filled, or all those applicants who passed the threshold level of both tests and interviews are placed. Those applicants who have not been accepted are advised to contact TAFE for vocational counselling.

3.6 TASMANIA

Advertising

In Tasmania each college is responsible for its own selection of students, and for advertising its courses. There are college-based Women's Access Co-ordinators who ensure that advertising is designed to attract female participation in the courses. Advertising is usually done through high schools. There is no advertising or information in ethnic languages, however, a new access course was established in 1984 at Hobart Technical College to teach English used in trades. This is to assist young migrants to cope with the English requirements of TAFE trades courses, and through this some migrant communities have become aware of the pre-vocational courses.

Hobart TAFE college provides all high schools in its area with details of the courses, and information folders. This information is also sent to Government departments involved in the employment of young people.

Hobart TAFE college selection

Pre-vocational courses were introduced in Hobart in 1981, but only 26 of the 72 students gained the end-of-course certificate. The major reason students gave for dropping out was problems they experienced with mathematics. In 1982, courses were run in five trades areas with only twelve students in each. This was much more successful in terms of retention but there were still problems with the mathematics content of the courses, and also with technical drawing.

In 1983 it was decided to use a mathematics test to select students who could cope with the mathematics content of the courses. This test was devised by college staff from the Student Services Unit and the Department of Special Programmes. It consists of basic multiple-choice items of about Year 10 level. The test has not been validated and test items are changed each time the test is used. The minimum threshold score depends on the particular trade.

Testing is seen as important since:

- the student feels he/she has earned a place and therefore values it;
- students who are accepted in the course are capable of doing the mathematics component, but where remedial help is available a lower standard may be accepted;
- if it becomes apparent that remedial courses are required, they can be arranged.

Electrical trades candidates do a second, more difficult mathematics paper. This has been devised from observation of the mathematics used in the course. Staff would like the mathematics tests to be further developed.

Applicants for all courses who pass the minimum threshold in the mathematics tests are interviewed. The head of the relevant TAFE college department, the course convenor, plus a member of the apprenticeship board or a tradesperson are on the interview panel. Interviewers ask about the applicant's interests and hobbies; try to discover if the applicant has a genuine interest in the area, and whether he/she is active and diligent.

Reports of those who are rejected are reviewed in an attempt to place them in other courses.

After selection, students (except pre-vocational printing and horticultural students) are given a reading test and diagnostic test in mathematics to discover if they require remedial help.

Girls tend to apply only for graphic arts or hairdressing. There is publicity aimed at attracting them into other areas. There is no official positive discrimination; however, if she appeared at all suitable for a non-traditional area, a girl might be given special consideration.

Launceston TAFE College selection

Launceston TAFE College selects students for pre-vocational trades based courses by interview; however, a threshold level of passes at Year 10 level in English, Mathematics and Science are a prerequisite. The level of pass required varies with different trades. TAFE staff are concerned that parity does not exist between Year 10 certificates at different schools.

Launceston TAFE staff involved in selection have expressed an interest in the development of validated, reliable tests to select students for pre-vocational courses. They have reservations about tests currently available.

Interviews are conducted by a panel of up to four heads of the departments which form the families of trades. Interviewers look at school reports for evidence of academic attainment and also question the applicant about his or her motivation and interest in the course, and relevant experience.

Other Tasmanian TAFE Colleges

If they have more applicants than places, colleges will frequently make a short list based on the applicants' academic results at school, and only interview those on the short list.

Tasmanian methods of selection are not standardised or validated, and are felt by staff involved in selection to require further development.

3.7 AUSTRALIAN CAPITAL TERRITORY

In the ACT, pre-apprenticeship courses are run at Canberra College of TAFE and at Bruce TAFE College.

Canberra College of TAFE

Advertising

At Canberra TAFE College, the course is automotive pre-apprenticeship. All high schools are notified, and there are advertisements in the local press. There are no advertisements in ethnic languages, nor advertisements particularly aimed at females, and no special consideration is given to girls. It has been difficult to attract sufficient applicants to fill the courses, and advertising will be increased.

Tests

All applicants are given the following tests:

- ACER—Non verbal IQ

- Mathematics—using the diagnostic test used at Hobart TAFE College

- Trade vocabulary—using a test devised at Moorabbin TAFE College

These tests are used as a threshold level selector to screen out those who do not meet the minimum standards and to provide information for counsellors to discuss with applicants during the interview. For each of the tests, candidates are rated as 'low', 'medium', or 'high' scorers but their actual marks are not used.

Interview

The interviewing panel consists of college teaching and counselling staff. All applicants are interviewed and selection is based on the test ratings plus the interview. Students are advised of the interviewers' perceptions of their suitability, but all those surpassing the threshold on the tests are entitled to apply for admission. Applicants who obtained a low score on the mathematics diagnostic test are advised to seek remedial help and re-apply after this. As there is no surfeit of applicants, all who are considered capable of completing the course are accepted. As yet there has been no research to validate this method of selection.

Bruce TAFE College

Advertising

The pre-apprenticeship course at Bruce TAFE College is in Carpentry and Joinery. It is advertised in the newspapers. There is no continuous contact with high schools. However, there is an annual Careers Display at Bruce which includes information about the pre-apprenticeship courses and schools in the region transport students to it. There is no advertising specifically aimed at interesting girls in non-traditional trades areas, and there is no special consideration given to girls in the selection process. Feasibility studies are now being conducted into ways of increasing female participation in the program in 1985.

The standard enrolment form asks for details of schooling—but this is not considered in selection. However, candidates must be old enough to be able to become apprentices after the course.

The diagnostic mathematics test used in Hobart is given to all candidates to discover whether students require remedial help. It is not used as a selection test in Bruce TAFE College.

Interview

Selection is by interview. The panel consists of the Head of the Building School, a student counsellor, the Head of the Pre-Apprenticeship Department and the Master of Apprentices of the Master Builders' Association. There are no formal guidelines for interviews but they tend to take the same form.

Candidates are asked to bring drawings or models as evidence of their skill and interest in the area plus their school reports and references from any employment or work experience. School reports are used to learn about the applicant's behaviour, but their school examination results are not considered for selection purposes.

3.8 NORTHERN TERRITORY

Rationale of courses

Pre-vocational courses in the Northern Territory are unique in Australia as they are still very much within the 'transition education' ethos, and are designed to make disadvantaged young people more employable. For example, the Darwin Community College's handbook states in its introduction 'This course is designed to be undertaken by unemployed youth who wish to do studies which will equip them to enter the job market with skills useable by prospective employers.' (Pre-vocational Trades Based Courses, 1984, p. 1). Recruitment is therefore largely done in co-ordination with the CES, rather than in high schools as in other parts of Australia.

Vocational training commission tests

The NT Vocational Training Commission (VTC) in Darwin runs tests for potential apprentices throughout the Northern Territory. Pre-vocational course applicants may take the tests, but are not obliged to do so. The tests consist of three parts:

- A mathematics test—locally devised and not validated, but well accepted by industry. It has been found by staff to be a fairly accurate predictor of an individual's potential to pass a pre-vocational course. Trades were graded by the VTC into three levels of difficulty, according to the theoretical components of the college course. Minimal levels of mathematics, as defined by scores on this test, are required for entry into these three grades of courses.

- An ACER Reading Comprehension Test—this was designed as a general reading achievment test rather than as a predictor of future success in trades areas, although it may have some predictive ability. It is not a measure of an individual's understanding of English used in trades instruction or on-the-job.

- An essay entitled 'Why I would like to be an apprentice'. This is to tap interest and motivation.

Where a person has completed the test, but not obtained an apprenticeship, he or she may provide the test results in support of an application to enrol in a pre-vocational course.

Darwin Community College

Advertising

The courses are advertised in newspapers and on the radio as well as via the CES. It is emphasised that girls are welcome. The budget for advertising is very small and there is no advertising in ethnic languages, although Darwin has a high proportion of migrant people. Approximately 50% of the prospective students apply directly from school, and 50% are referred by the CES. The course begins exactly four months after school finishes so that the students can receive transition education allowances, plus a NT state grant of $300 for equipment. This means that potential students need not be excluded because of lack of money to support themselves.

Testing and interviewing

Darwin Community College screens pre-vocational students on the basis of two tests and an interview. The tests consist of the ACER Word Knowledge Test and a mathematics test which has not been validated and is of approximately Year 10 standard. It was not devised on the basis of course or on-the-job mathematics.

The initial interview is given to all students, and from this a short list is formed. Test results are then considered. Applicants who have done the VTC test may bring their results to support their application, and these are considered in conjunction with the selection test results.

Those candidates who are short listed after the tests and interview are invited back for a second interview. It is college policy to call students in two or three times as a test of motivation as it is considered that those less motivated will probably not persevere. Applicants are asked to bring their school and work experience reports, and references. While the panel reads these, the applicant writes a short essay on his/her reasons for wishing to do the course. Final selection is based on all of these. As there are not many applicants in the NT, some selected are less than ideal, i.e., the threshold level has not been clearly established, which may partially explain the withdrawal rate which is considerably higher than other States. Staff would like a short probationary period (of a few weeks) before either the college or the student made a firm commitment, but this has not been implemented.

The Community College of Central Australia selection

Advertising

Pre-vocational courses at CCCA are advertised in the local press and at the CES. There is no advertising specifically directed at female participation, and no girls have applied for the courses. Many applicants are referred by the CES. All applicants who meet the educational requirements (it is preferred that they have completed Year 10) and show interest in the course during the interview are offered places.

Testing and Interviewing

The interview panel consists of the four heads of the departments represented in the families of trades in the course.

No selection tests are used. The interviewers look at school results, evidence of interest and experience in the area, and the way the applicants present themselves. There are no set guidelines for interviews, but they take the form of questions about the student's schooling and interests, plus a discussion about the course and the trade.

3.9 SUMMARY

Individual TAFE Authorities, when selecting students for pre-employment courses, vary widely in:

- their concept of the client group;
- the ways in which they make the client group (and their parents) aware of the courses;
- special provision for under-represented groups;
- selection methods employed.

Most TAFE Authorities select on the basis of paper and pencil tests, usually including tests of reading and mathematics, combined with an interview. Individual TAFE Authorities rarely have the resources either of time or money, to further develop and evaluate their selection methods, so many tests have not been validated for pre-employment selection, and some may be inappropriate as predictors. Many TAFE staff involved in selection expressed concern over these problems.

Each TAFE Authority has developed its own methods of selection to suit it own particular situation. However, there are some ideas which are particularly useful which other TAFE Authorities might consider incorporating. These include:

- inservice courses for high school counsellors to familiarise them with TAFE courses;
- information in both leaflets and advertising translated into ethnic languages to inform non English-speaking parents about the courses. These could provide a phone number for an ethnic language information service, available for a few weeks before the enrolment period;
- all advertising designed to make it <u>immediately</u> apparent that pre-employment courses are open to both sexes;
- a counselling service available to those not selected for the course, to assist them to make vocational choices;

- selection tests based on material used in the pre-employment courses, or elements of skills used on the job;

- trainability tests which reduce, but cannot eliminate, the effect of previous experience. These aim to predict how readily an applicant will learn trade skills;

- use of continually updated Australian norms;

- use of biographical data, such as school reports and references. This information could be made more reliable by devising short, standardised forms with clear guidelines;

- use of bridging courses for those groups of young people who are under-represented in pre-employment courses e.g., girls, and people from non-English speaking homes;

- consideration for final selection limited to those who are above the threshold level on whatever predictors are used, i.e., only those with a reasonable probability of success are considered, even if this results in classes being unfilled.

There is a wide variety of selection methodology for Australian pre-employment students, and from this, and what is being explored overseas, a number of different methods of selection could be developed, based on the requirements of the course and/or the job. Many of those involved in selection for pre-employment courses stated they would welcome such development.

CHAPTER 4

DISCUSSION

4.1 EQUITY OF ACCESS

One argument presented in this paper is that, despite a contracting job market, Government-funded training courses which improve a young person's career prospects must encourage applications from all young people, regardless of sex or racial origin, or whether they are recent school leavers or unemployed.

Some groups are under-represented in pre-employment trades based courses. However, should there be positive discrimination in selection for one group this would mean negative discrimination for another, which may be considered to be inconsistent with the concept of equity. The best applicants, as defined by the selection criteria, should be selected regardless of sex, ethnicity or other factors. Means should be found before selection to assist members of under-represented groups to compensate for any factors which may be preventing their selection (e.g., special bridging courses for girls, to familiarise them with trades courses, which they traditionally do not enter).

Bridging courses in trade education

Examples of one group of bridging courses are those designed to compensate for the fact that girls frequently have less access to workshops than boys and thus may be disadvantaged when competing for places in pre-vocational courses. Many girls do not consider an apprenticeship outside of traditional female areas, and know very little about what is involved in being a tradesperson, both in terms of the job, and of training. Bridging courses can be designed to provide this information, and to make girls aware of possible opportunities for themselves in non-traditional areas. In an all-female trades class, girls are more likely to develop confidence so that they can later cope in a mixed class where they would probably find girls a very small minority and possibly be teased or ridiculed. An example of such a bridging course is the 'Introduction to Trades' course available to girls in South Australia.

However, as the number of single parent families increases, and because of the background of some refugees, it is possible that there will be numbers of boys who have had little experience of the workshop. It would be inequitable if they were excluded from bridging courses on the grounds of sex! Similarly, some applicants for pre-employment courses from non-English speaking homes may be unfamiliar with Australian workshops and trade terminology, and would benefit from a bridging course. Ideally, TAFE colleges would run several bridging courses, according to demand; some for girls only, others for boys and girls, so that young people could choose the course where they felt most comfortable.

Some of these bridging courses could be run through schools, as link courses, and lead into work sample courses (as described in Chapter 2). Others could be made available outside working hours. As much variety and flexibility as possible should be provided in order to offer access to all who require it. At the end of a bridging course, students should be able to compete more equally with other applicants for places in a pre-employment course. However, it is inequitable to give any group preferential treatment in the actual selection for pre-employment courses.

Advertising

It is essential that information about courses be disseminated widely and in such a form that under-represented groups realise that they form part of the client group. As parents are often the people who notice advertisements about courses, and want to find out more to assist their children, it is important that some advertisements be placed in ethnic newspapers, and/or on ethnic radio. Migrant families frequently are more paternalistic than other Australian families, and the parents are likely to play a more significant role in their children's career choice. If the parents know nothing about TAFE courses, they are unable to encourage their children to enrol, and they may have a negative stereotyped idea of a TAFE college and actively dissuade their children, especially their daughters, from attending.

Allowances

The fact that there is no living allowance for many pre-employment courses was discussed in Chapter 1. This is seen as discriminating against those young people who have no other means of financial support and who are unable to exist on the training allowance. It particularly disadvantages young people who would have to live away from home to attend pre-employment courses.

4.2 SELECTION

Staff from a number of TAFE Authorities stated there is a need for selection methods for pre-employment courses to be further developed and validated against performance on the course and on the job.

A wide variety of selection methods are currently being used in Australia and overseas. A number of different approaches to selection could be developed, some general, others specific to particular trades or courses. It is important that they be normed on Australian pre-vocational students and validated against performance on the course and/or on the job, so that users know what the criteria are against which applicants are being measured.

Selectors could choose those methods of selection which were relevant to a particular course, or group of courses, and use these. It could be argued that a number of different methods be used to select among candidates for available places.

The choice of selection methods and tests will be dependent on such factors as the target group, the predictive validity of the specific measures, the likely number of applicants, and the budget available. Therefore, selection will vary between courses and between TAFE Authorities.

In selecting students for pre-employment courses, two levels can be considered—threshold and entry.

Selection among applicants must be by methods which have been found to be valid predictors of performance on the course and/or on the job. Tests which are only measures of threshold (as described in Chapter 1) should not be used further to contribute towards a final selection. For example, a certain level of reading and mathematics is essential to cope with written instructions, course materials, trade specifications, and measurements on the job; but a much higher level does not necessarily mean a much better tradesperson—other factors may be far more significant.

Threshold level

Before the selection process begins, the minimum requirements for performance in the course and on the job, should be established. This is done by analysing tasks performed on both the course and on the job. For example, what mathematical processes, and at what level, are required; is physical strength required; what level of reading is necessary to follow class work and trade specifications; and what level of dexterity is essential? Depending on the trade, threshold requirements may include such factors as the ability to pass a particular grade of mathematics and English. However, it is generally more appropriate to specify attainment of skills directly related to the content of the course. The best predictor is usually the one which is most closely related to course content. It is not equitable to place barriers in front of those with less formal schooling. Threshold selection tests should discover whether such people have the ability to do the course, and so compensate for their lack of academic qualifications. Some young people are alienated from the school environment, and have 'dropped out' before completing Year 10. TAFE, by providing a different learning environment, can offer these young people another chance to gain qualifications and skills which will assist them to gain employment.

For some trades, certain physical problems such as epilepsy (unless it is medically controlled), deafness, or colour blindness may create such risks that applicants with these problems would have to be excluded.

Some of this information could be obtained on the application form, and later verified by producing school reports and a medical certificate at the interview. As far as possible, threshold level selection should be done before any additional expensive and time consuming testing is performed.

The acceptance of applicants who do not reach the threshold level is unjustified for three reasons:

- it is unfair to waste the time and possibly lower the self-esteem of applicants who have little chance of success;
- it is an inefficient use of limited resources;
- it reduces the credibility of the course both to other class members and to industry.

Entry level

Entry level tests were described in Chapter 1. Following an entry level test candidates are usually ranked in order of suitability for the course. Places are then offered starting at the top of this list. Entry level is the minimum level, on whatever selection method used, at which candidates are offered places in the course. It is the point at which either all places are filled, or there are no more candidates who have met the threshold requirements.

Face validity

When selection is being made for a number of quite different courses, or courses which lead to credit in a number of different areas, there is the problem that some of the tests may lack face validity for some courses. For example, the New South Wales Wire-Bending Test is often seen as irrelevant by candidates for places in hairdressing and cookery although in practice, hairdressing teachers have reported that those students who scored highly on this test also did well in the course, possibly because it tests manual dexterity.

Lack of face validity can upset some candidates, and some who have been unsuccessful in gaining a place may feel they have been tested unfairly.

Trainability Tests

Trainability tests as discussed in Chapter 2 are one way of overcoming the problem of lack of face validity.

There would need to be several tests administered where candidates wished to be considered for several courses, which were in different trades. However, in practice this need not be an insurmountable problem—candidates could elect to do tests in one or two areas on the day of testing. If they were unsuccessful in these, but on the basis of their results on other measures in the battery could possibly be offered a place in some other area in which they had expressed an interest, they could be called back for further testing. It is unlikely that large numbers would be involved in this, and the additional cost of the extra testing could be compensated by the selection of more suitable trainees. It would have the advantage of using selection criteria the applicants would see as fair, and thus be more likely to be affected by their level of interest and motivation (see Gordon and Kleinman, 1976).

A possible means of testing trainability would be to involve potential applicants in link courses. While still at school, students with an interest in a particular trade area could elect to do a link course in which their performance over a period of weeks in this trade area would be rated by college staff who, having no preconceptions about the students, would be evaluating such students solely in terms of their performance in the trade area. A link course of, for example, two weeks would give the raters time to make a fair appraisal of the students' capacities, even when the students varied a lot in their previous experience in the area. The students' ability to learn new skills after instruction could be observed, thus these courses could have a trainability test component. This would also serve a purpose similar to that of the probationary period suggested by Darwin Community College staff, and would give prospective students an opportunity to decide whether they were really interested in the trade.

The students would benefit by gaining insight into the proposed career, and thus be in a better position to make a career decision.

They would have had the opportunity to learn both positive and negative aspects of working in the trade, and a chance to discover for themselves whether the area suited their interests and abilities. This should mean fewer students later withdrawing from the pre-employment course.

Interest in the area and motivation are very important factors in success in both the course and the job. Unfortunately the highly valid test of motivation remains as elusive as the Holy Grail. However, link courses would assist both students and their teachers to form some idea of the students interest in, and motivation towards, particular trades areas.

For applicants to pre-employment courses who had left school, or where schools did not offer link courses in a particular trade area, similar courses could be run over a number of weekends, so that all applicants could be rated. Completion of such a course would indicate that an applicant had a high degree of motivation. Clearly, some applicants would be unable to attend such courses, and attendance would not be a threshold requirement. However, the ratings of those who attended could well have a very high validity.

Ratings could be made of factors such as:

- ability to perform basic skills after instruction (making allowance for varying amounts of previous experience). This performance would be the key factor in selection;
- interest in the area;
- ability to act upon instructions similar to those used in pre-employment courses;
- ability to read and comprehend instructional material of the type used in pre-employment courses;
- general maturity;

- attitude to work related aspects of the course, and punctuality.

Biographical Data

The High School teachers' recommendations are not used extensively for selection of students in pre-vocational or pre-apprenticeship courses at Australian TAFE colleges, yet teachers may have had frequent contact with the candidate over years, and thus may have a far better knowledge of his/her behaviour, abilities and interests than can be gauged from an interview where the candidate feels under observation.

Reasons for not including teacher's evaluations include:

- some teachers have philosphical objections to making any negative statements or evaluations of students;
- some teachers may be so anxious to help their students gain a place in the course that they might overestimate their students' abilities;
- statements from different teachers and different schools are difficult to compare;
- students might challenge poor ratings, embarrassing the rater and reducing validity;
- teachers might object to requests for detailed references, particularly at the end of the year when they are already under considerable work pressure.

However, these problems could to a large extent be overcome by devising a standardised rating form with clear guidelines. This could include a rationale for the use of the rating forms which would explain to the rater the need for objectivity, and provide examples of ratings.

To increase impartiality, ratings could be made by two teachers from different subject areas. The scales would have to be short, less than ten items, and with each item clearly defined. This would reduce the demand on the rater, as would devising a form where ratings could be indicated by a mark in a box or on a line, rather than in writing.

These ratings could be considered first at the threshold level to determine if the teacher's long-term knowledge of the applicant has given them insight into any reason why the applicant could not cope with the pre-employment course or on the job. They would also be a valuable part of the information considered at the entry level.

Liaison with teacher's unions might be essential to explain the reason for the rating scales, and to overcome opposition.

Kays, (1983) states:

> . . . tests given on one day are fraught with all the usual hazards which lead to small but significant proportions

> performing way above and below their 'true' capabilities. Most of the students being tested have spent four years at high school, during which time a wealth of information has been collected about their abilities, attitudes and aptitudes. Using this information as at least one input into the selection process would greatly improve its validity . . . (p. 7)

Wilson (1982) found that employers generally used school reports to try to learn about an applicant's personality traits, even when the school report was not designed for this. Employers looked for evidence of perserverance, punctuality, work ethic and other work-related characteristics and would sometimes try to estimate these from quite inadequate evidence.

Thus, a case can be made for the development of some well designed, standardised instrument whereby teachers can make these assessments.

Wilson's recommendations to the Victorian Institute of Secondary Education included:

> . . . such policies also need to be supported by action which enables teachers to spend sufficient time on preparing assessment procedures and reporting on these, particularly when descriptive assessment statements are part of the reporting procedures. The implementation of a program to develop teachers' expertise in writing descriptive assessment statements, especially in writing them in such a way that the likelihood of their misinterpretation is minimised, is also needed. (pp. 38-39)

There remains the problem of the applicant who was alienated from school and who would therefore most likely receive a poor rating from teachers. This young person might find TAFE's different environment more congenial, and become a good student. As with every selection method, the rating scale should be seen as merely an indicator of probabilities, best interpreted with other sources of information about the candidate's suitability.

There have not been conclusive studies of the validity of a teacher's evaluations of candidates for places in trades-based courses. Breland (1981) reviewed assessment of student characteristics in admission to higher education, but literature searches have not revealed similar studies of the validity of teachers' evaluations for pre-employment courses. This is another area in which further research would be valuable.

Interviews

Wright (1969) summarised research on selection interviews from 1964 to 1969. He found:

- structured interviews exhibited the best inter-rater reliabilities;
- there was little evidence of the efficacy of the interview with regard to cost or optimum length.

Wright recommended that there be further research on the structured interview as, although its validity had not been demonstrated, it is widely used both by TAFE and industry. This has been confirmed by Williams and Priest (1978) who found interviews were used by all the employers they studied. Wright concluded that interviews should be made more useful and economic, as, regardless of their proven worth, it is probable that they will continue to be used.

Others have supported this view:

> If we have a number of inexperienced managers or professionals in technical studies who are called on only occasionally to conduct a selection interviews, we may improve decision accuracy, . . . by providing them with an interview summary evaluation form that consists only of important job applicant characteristics (Schuh, 1973, p. 258).

As well as its function as a method of selection, the interview can serve as a means of informing applicants about the job and the course; and discussing these with applicants. Ideally, after the interview, both the interviewer and the interviewee will have a clearer concept of how well suited the applicant is for the course.

CHAPTER 5

RECOMMENDATIONS

There is great variety in selection methods used by different TAFE Authorities in Australia. Each has strengths and weaknesses and by taking advantage of the strengths and using the knowledge gained from research a number of recommendations can be made for improving the selection procedures for full-time trades based pre-employment courses.

On Selection Levels

Two levels of selection have been recognised—'threshold' and 'entry'. The threshold level selection measures are designed to identify those applicants who possess the basic requirements to cope with the demands of the course and the job.

The entry level measures are designed to select between applicants who have reached the threshold level, when there are more applicants than available places.

Entry level selection will normally involve a smaller group of applicants than threshold level selection and this in turn has implications for the costs associated with selecting at the two levels.

Recommendation 1

That for each trade area, threshold level measures be designed which assess whether applicants possess the basic requirements to cope with the course and the job.

Recommendation 2

That for each trade area, entry level measures be designed which will enable selection to be made between applicants who possess the basic requirements (threshold level) in situations where there are more qualified applicants than there are available places.

On Student Profiles

There are a number of advantages to be derived from the creation of a pool of selection methods. By considering a range of characteristics it is possible to gain a more comprehensive and useful picture of just what an individual can or cannot do, and likes or does not like.

Applicants can be described in a variety of ways, and weaknesses in one area can be compensated for by strengths in another. Thus, students will have different strengths and weaknesses, and these can later be matched to the requirements of different employers.

Recommendation 3

That those involved in selection have available to them a pool of selection methods which ensure a range of characteristics are taken into account in making decisions.

On the Feasibility of Individual Measures

Before definite decisions are made about their development, feasibility studies should be undertaken to establish the cost-effectiveness of developing trainability tests and apparatus tests. Discussions should be held with teachers' organisations to ascertain teachers' acceptance of rating forms for school leavers.

Recommendation 4

That feasibility studies be made before new selection methods are developed as part of a selection profile.

On Research and Evaluation

A predictive measure is valid only to the extent that it does predict what it purports to predict. Thus selection methods are valid to the extent to which they predict performance on the course, and/or on the job. Research is required to establish this validity, but unfortunately TAFE Authorities rarely have resources for such research, with the result that many currently used selection methods have not been validated. Until they are validated there is no way of establishing which are the best predictors for inclusion in any battery of selection tests.

The norms against which applicants are compared must be drawn from a comparable population so that an individual can be compared meaningfully with the group.

Recommendation 5

That Australian norms be compiled, and continually updated, using data from the pre-employment course target group.

Recommendation 6

That selection methods be validated against both course results and later on-the-job performance, and that only those methods which are found to be valid predictors be included in the pool of selection measures.

On Equity of Access

Some young people have not had access to the experiences, both educational and other, which would enable them to pass the threshold level of selection. There are a number of ways in which such people may be assisted to meet the threshold level, such as bridging courses, remedial programs or link courses. These courses can assist the young

person to acquire the skills (such as a certain level of numeracy and literacy) which are essential to perform adequately in the course.

Other selection methods currently used measure prior knowledge which can be readily acquired on the course, such as tool recognition. This test may discriminate against particular groups of otherwise suitable applicants who may have had restricted opportunity to acquire this knowledge, such as applicants who have had no opportunity to use workshops or do courses of technical studies. It is important to use selection methods which do not have this problem.

Use of selection methods which do not unfairly discriminate against particular groups, and of special courses to assist those who are unable to meet entry level requirements which depend upon past experience, would mean that all applicants would be given equal opportunity to compete for places in the course. It would then be inequitable for preference to be given to any group in the actual selection process.

Recommendation 7

That bridging courses be made available to under-represented groups, designed to overcome problems they might have in gaining entry into courses.

Recommendation 8

That link courses be provided for all school students interested in trades areas, to include a formal trainability test, instructor's rating and vocational guidance, as well as information detailing what it is like to work in the trade.

Recommendation 9

That applicants who are not offered a place on the course be advised of other courses for which they might apply. Where appropriate, remedial courses may be recommended.

Recommendation 10

That all selection methods be carefully screened to ensure that they do not unfairly discriminate against any group.

Recommendation 11

That all applicants for places on the course be selected by the same methods, to ensure there is no discrimination against any group.

APPENDIX

MISSOURI VOCATIONAL TECHNICAL PROGRAMS 1982

COUNSELLOR'S RECOMMENDATION

NAME OF STUDENT: _____

NAME OF SCHOOL: _____ GRADE LEVEL: _____

NAME OF COUNSELLOR: _____

DATE OF RECOMMENDATION: _____

Please evaluate the applicant on the following criteria. We need your opinion of the applicant reduced to a numerical equivalent so that your recommendation can become part of an overall numerical rating, which includes other criteria for admission.

Please circle the number on each scale which best reflects your opinion of the applicant.

Record of academic achievement, attendance patterns, and ability to accept responsibility.

PAST SCHOOL PERFORMANCE

Poor		Fair		Good		Very Good			Excellent	
0	1	2	3	4	5	6	7	8	9	10

Attitude, motivation, reliability, and program interest.

POTENTIAL FOR SUCCESS IN VOCATIONAL EDUCATION

Poor		Fair		Good		Very Good			Excellent	
0	1	2	3	4	5	6	7	8	9	10

Past grades, test scores, ratings on four specific program criteria*, teacher's recommendation and all other assessment scales

* i.e. separate school subjects

COMPOSITE ASSESSMENT	Poor		Fair		Good		Very Good			Excellent
	0	1	2	3	4	5	6	7	8	9	10

TOTAL POINTS:_____

GENERAL COMMENTS:_____

_____

MISSOURI VOCATIONAL TECHNICAL PROGRAMS 1982

TEACHER'S RECOMMENDATION

STUDENT'S NAME: _____ PERSON RECOMMENDING _____

SCHOOL _____ SCHOOL: _____

DATE: _____ CONTACT WITH STUDENT:

_____

(subject area) (Grade level)

Please evaluate the applicant on the following criteria as they relate to your experience with the student. We need your opinion of the student reduced to a numerical equivalent so that your recommendation can become part of an overall numerical rating, which includes other criteria for admission.

Please circle the number on each scale which best reflects your opinion of the applicant.

ATTITUDE: Shows positive overall feelings toward school, teachers, and peers; able to work well with others; co-operative and friendly; can take orders as well as give them; good self-discipline.

Poor		Fair		Good		Very Good			Excellent	
0	1	2	3	4	5	6	7	8	9	10

RESPONSIBILITY: Willing to accept duties and responsibilities; follows directions; assumes the initiative when necessary; completes assignments; trustworthy; responsive to changes; requires minimal supervision.

Poor		Fair		Good		Very Good			Excellent	
0	1	2	3	4	5	6	7	8	9	10

NEATNESS: Strives for precision, accuracy, and quality in the performance of tasks; follows assignments or guidelines carefully and in an orderly manner; works to acceptable standards; shows pride in accomplishments.

Poor Fair Good Very Good Excellent

0 1 2 3 4 5 6 7 8 9 10

TOTAL POINTS:_____

GENERAL COMMENTS:_____

_____

_____

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